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ABSTRACT

The purpose of this project is to present the results of the authors efforts to analyze classroom discourse into strategies. The source of data used in this investigation is the same as that which was used in the previous study of the logic of instruction. It consists of recorded classroom discourse at the high school level including grades nine through twelve. Five consecutive class sessions where recorded for each teacher of each subject at each grade level. The recorded classroom discourse was transcribed and dittoed, and the dittoed materials were used in making the analyses both of the logical operations and of the strategies of instruction. It is hoped that this study will afford a broader and more adequate empirical base upon which to rest experimental studies of teaching. (JL)

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A STUDY OF THE STRATEGIES OF TEACHING

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Jerrold Coombs
Graham Nuthall
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BUREAU OF EDUCATIONAL RESEARCH
COLLEGE OF EDUCATION
UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS

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Chapter I

INTRODUCTION

In our earlier research report on the logic of teaching[*] it was pointed out that teaching is essentially a system of social action involving an end, an agent, and a situation. It was further noted that the situation consists of two sets of factors. One set was comprised of such elements as class size and characteristics of pupils; the other set being made up of elements such as assignments and the asking of questions. The last of these sets of factors was referred to as the means of instruction. It consists in subject matter and instructional paraphernalia and the ways of manipulating and maneuvering these.

This earlier study of the logic of teaching consisted in an analysis of classroom discourse to ascertain some of the logical operations involved in teaching. In the present study we are concerned with the larger maneuvers having to do with the control of the subject matter of instruction. These maneuvers we refer to as strategies. It was pointed out in the report on the logic of teaching that strategies are concerned with attaining certain outcomes and are, hence, directly related to objectives. It is the purpose of the present report to present the results of our efforts to analyze classroom discourse into strategies.

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[*] Smith, B. Othanel; Meux, Milton; et al. A Study of the Logic of Teaching. Bureau of Educational Research, University of Illinois, 1962.

The source of data used in this investigation is the same as that which was used in the study of the logic of instruction. It consists of recorded classroom discourse at the high school level including grades nine, ten, eleven, and twelve. The subjects and grade levels covered by the recordings are given in Table 1. Five consecutive class sessions were recorded for each teacher of each subject at each grade level.

Table 1. Summary of Subjects and Grade Levels Recorded

	9th grade	10th grade	11th grade	12th grade	Totals
English	1		1	1	3
Mathematics	2*	1			3
Science	1**	1	2	1	5
History--Social Studies***	1	1	2	2	6
Total Number of Teachers	5	3	5	4	17

*The tapes for these classes could not be used because the amount of paper and pencil work rendered them useless.

**The tapes for this class were inaudible.

***Including a class in sociology and one in a core program.

The recorded classroom discourse was transcribed and dittoed, and the dittoed materials were used in making the analyses both of the logical operations and of the strategies of instruction.

The present report sets forth the breakdown of classroom discourse into units of instruction called ventures and tells how these ventures were classified into categories according to objectives. The report then goes on to show how the categories were analyzed into verbal moves that turn out to be elements of strategies. These moves, when combined into patterns, constitute what we refer to as strategies of instruction.

Like our earlier study of the logic of teaching, the purpose of the present investigation is to give a descriptive account of teaching behavior. This study is in no way an experimental inquiry. Rather it is a natural history study of the behavior of teachers as it occurs under classroom conditions. Given the present state of our knowledge about the teaching process, there would seem to be little need for justifying a study that attempts to describe in as objective a fashion as possible the behavior of teachers as they deal with students and the content of instruction. It is hoped that such studies will afford a broader and more adequate empirical base upon which to rest experimental studies of teaching.

Teaching behavior is many-sided. For this reason, we have been forced to select some aspect of it for study rather than attempt to analyze the behavior in its entirety. We have, therefore, concentrated upon the cognitive aspects of teaching behavior and have ignored those behaviors that have to do with the affective domain and with such elements as reinforcement and discipline.

This report is the work of the project staff. Each chapter was first written by one or more members of the staff and then revised by other members. In this sense each chapter is a group product. Nevertheless, we

shall indicate, chapter by chapter, the person or persons primarily responsible for preparing the first draft of each of the chapters included. Chapters I, V and X were developed by Smith; Chapters III, VIII and XIII by Coombs; Chapter VI by Nuthall; Chapters XI and XII by Precians; Chapter XIV by Meux; Chapter II by Coombs and Meux; Chapter IV by Coombs, Meux and Nuthall; Chapter VII by Coombs and Nuthall; and Chapter IX by Meux and Nuthall.

This account would be incomplete without giving credit to Mrs. Margaret Brengle for the role she played in preparing the manuscript, cutting the stencils, and producing the finished product. She helped in clarifying the discourse at certain points and also prepared the figures and diagrams in stencil form from copy that in some cases was exceedingly rough. For all her patience and help the authors are deeply grateful.

Chapter II

THE VENTURE: A UNIT OF DISCOURSE

The first step in identifying strategies is that of dividing classroom discourse into units in which strategies are to be sought. Not all of the units into which discourse is analyzable are of such a nature that it would be reasonable to look for strategies within them. It is unlikely, for example, that strategies would be found in time-sample units. As Barker has pointed out, a continuous stream of activity may be analyzed into units which reflect the inherent organization of the activity, or it may be analyzed into predetermined time periods, or number-of-occurrence segments, having no correspondence to the structure of the activity.[1] A strategy is a pattern which occurs in the verbal behavior of the classroom, and units in which strategies are found will occur as part of the organization of the discourse. To divide the discourse into time periods, or number-of-occurrence segments, is to risk fragmenting whatever strategies may occur in it.

Requirements of a Unit[*]

The first condition that a unit of discourse must satisfy is that it deal with a single topic. As one reads transcriptions of a class period, he notes that it seems to break into a few sections -- typically, five or six -- each one consisting in a treatment of a particular topic. The term "topic" cannot be defined to the point that either ambiguity or vagueness is completely avoided. In fact, a topic is more easily "sensed" as one reads the discourse if he does not try to keep a definition of the term in mind. The presence of a topic is indicated by the coincidence of the judgment of independent analysts as to the beginning of a new topic.

---

[1] Barker, Roger G. "The Stream of Behavior as an Empirical Problem." The Stream of Behavior, Roger G. Barker (Ed.), New York: Appleton-Century-Crofts, 1963, pp. 1-3.

[*] Adapted from Teaching Strategies and the Teaching of Concepts, by Jerrold R. Coombs. Unpublished doctor's dissertation, University of Illinois, 1964.

A second condition of a unit is that its discourse be relevant to some objective such as a cause-effect relationship, or a concept. The unit should include all the contiguous discourse relevant to the objective. That is to say, there should be no case in which part of the discourse relevant to a given objective occurs in one unit and part in a preceding or succeeding unit. Strategies will thus not be fragmented as classroom discourse is divided into units, assuming that a given strategy is geared to a single objective.

The unit of discourse which best meets these conditions is called a venture. A venture is a segment of discourse consisting of a set of utterances dealing with a single topic and having a single overarching content objective.

Exemplification of Unit Requirements*

The discourse of a class period is organized into a series of discussions of different topics. When reading a transcript of a class session one notes immediately this topical organization. In some cases, the change from one topic to another is heralded by the teacher's announcement that the class is going to discuss a particular topic. The segment of discourse cited in the example below illustrates such a case. This excerpt is taken from a discussion of prisons in a sociology class.

---

* Ibid.

Example 1

> T: And what about the plant (physical plant of the prison)? Does it have these divisions like they had back here? Some lived in dungeons. Are they things we find in modern-day prisons? Or do we find prisons having adequate light, sanitation, ventilation, or things that make for the well-being of the prisoner's health? Which one?
>
> S: Oh, yeah, they--they are--
>
> T: All right. Adequate reason for [inaudible]. Well, you can understand by having a prison plant to do that.
>
> * * *
>
> Now, then, a while ago Joannie mentioned something else that is being done. She mentioned probation, and we said we would devote a little time in discussing that, and in connection with it we'll discuss parole. First, what does probation do?

As already suggested, in the discourse prior to this segment the class has been discussing the characteristics of modern prisons. Discussion of this topic ends at the point indicated by the three asterisks. Here, the teacher announces that the class will discuss probation and parole. Then, she proceeds to initiate discussion of this new topic by asking what probation does.

Not every change in the topic of discussion is signaled by an announcement that a particular topic is going to be discussed. The shift from one topic to another may be occasioned by a question which starts the discussion in a new direction. Example 2 contains an utterance in which a question produces a change in the topic. In the discourse immediately preceding this utterance the topic was the causes of the Spanish-American War.

Example 2

> T: When they adopted their resolution concerning war, there were four specific points that Congress made. The first one had to do with Cuba. What did they say about Cuba?

The teacher's first two sentences set the stage for her question about the provisions of Congress's resolution concerning the war. The question itself initiates discussion of the war resolution. Discussion of the causes of the war is thus ended and discussion of the new topic is begun.

All samples of classroom discourse used in this study exhibit this topical organization, although discussions of topics are not all of the same duration. Some topic discussions cover only a portion of one page of transcript, while others may be four or five pages long. This is to be expected, since some topics are not worth discussing for the same amount of time as others.

The second requirement, i.e., that it be a unit containing a body of discourse relevant to a single objective, is also fulfilled by the venture. Any discussion of a topic contains a number of elements of content such as facts, rules, definitions, generalizations, etc. However, close examination of what seem to be paradigm cases of ventures suggests that it is possible to identify one element of content which is the central focus of discussion. That is to say, it is possible to identify a rule, concept, etc., which is explicated, established, or set forth by the discussion of the topic as a whole. This element is called the objective of the unit or more descriptively, the overarching content objective.

The elements of content set forth in the various statements occurring in the unit are subordinate to the overarching content objective and serve to delineate or establish it by giving evidence that supports it or examples which illustrate it, etc. Suppose a discussion were initiated by the question, "Does parental negligence cause juvenile delinquency?" Utterances in the discussion may state that parental negligence does cause such delinquency. They may cite several examples in which children with negligent parents were delinquent. They might define 'delinquency' or 'negligence.' They may note that insecure children are likely to be delinquent and cite facts to show that neglected children are often insecure. Note that the individual utterances in this discussion contain a number of content elements--facts, generalizations, and definitions. All of these, however, serve to set forth, explicate, and establish the generalization that parental negligence causes juvenile delinquency. Thus, this generalization would be the overarching content objective of the discussion.

Every venture contains a body of discourse relevant to a single content objective. Furthermore, analyzing classroom discourse into ventures makes it unlikely that situations will arise in which part of the discourse relevant to the content objective is found in a preceding or succeeding unit. There is apt to be no change from one venture to another unless there is a change from discussion relevant to one content objective to discussion relevant to a different content objective. Thus, each venture typically contains all the discourse relevant to the objective of that venture.

A number of ventures will be presented and discussed in the next chapter. However, it may be well to consider here at least one example to lend concreteness to the concept of a venture. The venture to be considered is one which occurred in a sociology class studying the problem of crime.

> S: If all of us had--parents had to pay for all the damage that a child did to somebody's property, what would that prove? Kids would keep on doing it even though the parents pay for it.
>
> B: Would they?
>
> T: What do you think about that?
>
> B: Well, if--if the parents had to pay for it, I think they're--they'd keep the kids home, or--or at least knew where they were going. And, if the kids lied about where they were going, they wouldn't go out again for quite a while. They'd keep a little closer tabs on the kid.
>
> G: Yeah, and the kids would think their parents were getting too strict and they'd start sneaking out and doing things behind their backs. You don't get anywhere.
>
> B: Well, that would bring on more punishment.
>
> G: Well, if they--you know-- [inaudible] a little and just [inaudible] or something. They had to pay for it, well, maybe they'd just put their foot down and make them work it out of their allowance and they wouldn't be so free to do anything.
>
> B: I think that's probably what a lot--a lot--a--how--how it would work out in a lot of places. In a lot of homes, parents wouldn't pay it; kids would. I think that would be a better law than--well, you can't hardly, I guess--I guess you couldn't do that, though, because you couldn't make a minor pay for something he did.
>
> T: Might make the parents a little more interested in the cases where the parents were at fault.
>
> B: Uh-hum.

T: And, I believe that Mr. Hoover has, on one occasion, said that a great deal of our juvenile delinquency was parental delinquency and possibly making them legally responsible for actions of children and financially responsible, would cause them to be a little more anxious to see children get what they should.

B: I don't think that--I mean, I don't think--just--the parents having an iron hand over the kids--that's--I don't think that's the answer to it. But, if you could get--if you could get a better understanding between the kids and the parents, so the kids would have more respect and have more respect for their own integrity, rather than just be afraid of what would happen if they did do something. I--I think that's the real answer to it but--

T: We all need to learn self-discipline, don't we? That is fairly necessary--in our society. We can't have policemen, or other law-enforcement officers stationed at every place, to check up on everybody, all the time. And it's necessary that we have a nation of people who are law-abiding, willing to abide by the law even when they--know there isn't someone there watching, to catch them in case they fail to abide by the law.

B: Last night on television, it was just a cowboy serial is what it was, but there was a good point brought out in it. People get the law that they deserve. The kind of law that they deserve.

T: What did--uh--?

B: Well, it was--this town was corrupt, it was run by one man--you know. And the marshal came in and they couldn't get anything done because all the jury was afraid of this one man, you know. And, this one guy brought out that point--that people ought to get the law that they deserve.

T: If they had been willing to insist on better things, law enforcement would have taken effect.

B: Have better law men.

T: One of the reports yesterday said that we would have this problem as long as people are willing to put up with it. And when they had all that they could stand for, then they would clear it up.

The topic discussed in this venture is how juvenile delinquency might be decreased. The content element disclosed by the discussion as a whole is that making parents responsible for the damage done by their children, getting children to have respect for their own integrity, and having people refuse to put up with delinquency are the means of reducing the amount of juvenile delinquency. Note that all of the discussion in this venture is concerned with indicating what the means of reducing delinquency are, or else, with supporting or refuting a claim that something is a means of reducing delinquency.

A student initiates the discussion by denying the proposition that to make parents pay for damage done by their children is to reduce juvenile delinquency. Several arguments either supporting or refuting this claim are presented. The teacher ends debate on this point by citing Hoover's statement that making parents legally and financially responsible for the actions of their children would decrease juvenile delinquency. Another student then states that getting children to have more respect for their integrity would be the best means of solving the delinquency problem. Discussion of this claim brings out the final point -- if people refuse to put up with juvenile delinquency it can be stopped.

Identification of Ventures

Ventures are identified by a set of criteria. Because of the complexity and variety of classroom discourse, such criteria are necessary to assure that judgments as to the identity of ventures will be as uniform as possible. The criteria developed in the present study are:

1. The beginning of a venture is identified by one or more of the following:

    1.1 An utterance or part of an utterance containing an explicit indication (announcement or proposal), usually by the teacher, that a particular topic is to be considered. Such an announcement is usually followed by a question which initiates discussion of the proposed topic or by an invitation to speak on the topic.

    1.2 An utterance not explicitly indicating that a particular topic is to be taken up, but containing a question or statement that makes a marked change in the course of the discussion.

    1.3 An utterance containing a question or statement that initiates a discussion characterized by a new overarching objective.

2. Qualifications.

    2.1 When a venture includes one or more utterances containing a story, poem, student report, etc., or parts of such works or reports, new ventures may be identified in the subsequent discussion by criteria 1.1, 1.2, or 1.3, although the discussion continues to be about the particular story, poem, etc.

    2.2 When a set of utterances concerns a number of mathematical problems, grammatical exercises, or other sorts of examples and instances illustrating a single general principle (a rule of usage, a formula, a type of proof), these utterances together with any discussion of the general principle or the instances shall count as a single venture.

2.3 When an utterance or set of utterances announces two or more topics to be taken up, the discussion of each topic counts as a venture, provided that each one is discussed independently rather than concurrently and provided further that discussions of the topics taken together do not form a unit having a single overarching objective. Discussions of the "pro" and "con," the "old" and "new," and other such bifurcations of the topic shall not count as separate ventures.

3. Exceptions.

3.1 If an utterance contains an explicit indication (announcement or proposal) that a particular topic is to be considered but another topic is discussed instead of the one announced, the utterance in which the topic is announced does not count as the beginning of a new venture. Such utterances are to be labeled 'misfires' and are not to count as part of any venture.

3.2 An utterance or set of utterances occurring within the discussion of a topic but wholly unrelated to the topic is not to be counted as the beginning of a new venture. Rather it is to be marked off from the venture and labeled 'disruption.'

3.3 An utterance or set of utterances containing a statement of the general subject with which class discussion is to be concerned for an entire period or longer, or statements of assignments, school announcements, etc., counts as an orienting statement and is not to be considered as part of any venture.

3.4 An utterance or set of utterances occurring within the discussion of a topic but only loosely related to the topic is to be counted neither as the beginning of a new venture nor as a disruption. It is to be counted rather as part of the venture within which it occurs.

4. The end of a venture is marked by no special cues. The termination of a venture is signaled only by the beginning of a new venture or by the occurrence of an orienting statement.

5. The duration of a venture is limited by the following considerations:

5.1 A venture always contains fewer utterances than the total discourse.

5.2 A venture generally contains more than one episode. A venture is only coextensive with an episode if it is not possible to legitimately consider the episode as part of the discussion of a more inclusive topic having a single overarching content objective.

Reliability of Procedures for Identifying Ventures

If the venture is to be useful as a unit of analysis, it must be possible for independent observers to identify the same or nearly the same ventures when analyzing the same tape transcripts.

There are two distinct aspects to assessing the reliability of the procedures for identifying ventures. One is the problem of getting a descriptive measure of the degree of agreement or consistency obtained among judges using the procedures. The second is the problem of deciding whether and how acceptable a given degree of agreement is for certain purposes. This second problem is really the more important one in our research, since it concerns whether we go ahead with these criteria or revise them.

For deciding whether the present procedures are adequate for our own research, we chose a simple descriptive measure of agreement among judges,* one essentially the same as was used in the Smith, Meux, et al., study.* We call this a coefficient of agreement.

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* An approach to reliability in terms of variance ratios (true to observed) would not really help our purposes much -- i.e., whether or not to revise the criteria for our research -- since it is no easier to make such a decision on the basis of variance ratios than on the coefficient of agreement. Of course, if we had a design allocating disagreement in judgments to the various sources of disagreement, then the variance approach might be more appropriate.

This coefficient of agreement is obtained by dividing the number of markings agreed upon by the two judges by the total number of markings of the team having the larger number of markings. (A marking is a mark in the transcript signifying the end of a venture or the beginning of a new venture.) Typically, a mark signifies both the end of one venture and the start of another. In some cases, however, there are misfires or orienting statements intervening between the end of one venture and the beginning of another.

In interpreting this coefficient of agreement, with respect to whether the criteria should be revised for our own research purposes, we feel that 50% (or below) agreement is so low as to require revision, that 60% agreement is not significantly different than 50%, and 70% (or higher) agreement is satisfactory for our research purposes (and perhaps for other researchers).

The procedure used was as follows: In the first phase -- the training period -- four judges having no previous experience with identifying ventures were selected and trained in the use of the criteria. During their training period the judges used the criteria to identify ventures in three tape transcripts, meeting to discuss the markings of each transcript before marking the next one. As an aid to understanding the nature of an overarching content objective the judges were referred to the taxonomy of educational objectives in the cognitive domain constructed by Bloom, et al.[2] They were told to use the objectives listed in the taxonomy as exemplars of types of content elements which could serve as overarching objectives. The judges were not instructed to limit the types of overarching objectives to objectives found in the taxonomy, however. Thus, the specific types of content elements which could be overarching objectives were left somewhat open.

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* Smith, B. Othanel, Meux, Milton, et al., A Study of the Logic of Teaching, Bureau of Educational Research, University of Illinois, 1962.

At the end of the training period each judge was given nine tape transcripts in which he was to identify ventures. These nine tapes represented a variety of different subject matters and grade levels. When the judges had marked their tape transcripts individually, they were divided into two teams having two members each. Each team then arrived at a team judgment of the ventures occurring in each tape transcript. The team judgments were used as the basis for calculating the coefficient of interjudge agreement for each tape.

Table 2 presents the coefficients of agreement obtained for each of the nine transcripts.

Table 2. Coefficients of Agreement Between Judges.

Subject	Grade	Coefficient of Agreement
World History	10	.86
World History	10	.89
United States History	11	.58
Sociology	11-12	.87
English	11	.70
English	9	.60
Physiology	10-11	.56
Physics	11	.67
Geometry	10	.75

---

[2] Benjamin S. Bloom (Ed.), Taxonomy of Educational Objectives Handbook I: Cognitive Domain, New York: David McKay Company, Inc., 1956, pp. 62-87.

These coefficients compare favorably with similar coefficients of agreement which Smith, Meux, et al.,[*] obtained for the identification of episodes. In both cases the median coefficient for the set of tapes was .70. However, the coefficient of interjudge agreement in identifying ventures ranged from .56 to .89 while the range of coefficients for episodes was from .62 to .73. As indicated above, the level of agreement for most tapes is satisfactory for our purposes.

Ideally, a reliability design would yield conclusions about sources of error variance. Although we do not have such a design, it seems relatively clear from our experience with the judges and an analysis of the disagreements among judges that a major cause of disagreement in those tapes with low coefficients lies in the fact that a discussion of one topic is sometimes a part of the discussion of a more inclusive topic. Thus, it is sometimes equally plausible and legitimate to divide a segment of discourse into three ventures, each having a single overarching content objective, or to judge it to be one venture, this venture, too, having a single overarching content objective. When confronted with such a situation one of the judges habitually marked the largest number of ventures, one preferred the smallest number, and the others showed no consistent pattern. (This seemed to happen especially in the Physiology tape -- the one with the lowest agreement -- in the discussion of parts of the brain.) A criterion to the effect that judges, when confronted with a situation such as that described above, should mark the largest number of ventures possible within the criteria could be added to the set of criteria for identifying ventures. Such a criterion should somewhat increase the coefficient of interjudge agreement in identifying ventures without impairing the validity of the venture as a unit within which it is reasonable to look for strategies.

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[*] *Ibid.*

Chapter III

CLASSIFICATION OF VENTURES

The purpose of dividing classroom discourse into ventures is to identify units within which strategies of teaching may be isolated and described. It is neither feasible nor theoretically desirable to attempt to search for strategies before the ventures are grouped into sets. The important question is one of deciding the basis on which ventures are to be classified. The answer to this question is to be found in the fact that a strategy is a way of attaining an objective. If ventures can be grouped into sets according to their objectives, each set can be analyzed to find out whether or not strategies are to be found within it.

Objectives as Cognitive Import

It should be clear at the outset that the objective of a venture is not be be equated with the teacher's intention. It is impossible from the verbal discourse alone to tell the teacher's intention as the verbal exchanges occur between the teacher and the students. Suppose a teacher asks, as a venture is introduced, "What does probation mean?" It is not clear from this verbal expression what the teacher hopes to attain. He may ask the question in order to impress the student with the fact that he has not understood the meaning of the term 'probation.' The teacher may have in mind to find out whether or not the student has read the materials that have been assigned him. He may be asking the question to induce discussion, or he may simply wish to call attention to the term in order that he himself might explicate it with more care than is done in the reference material. But whether or not the teacher's

intention is one or the other of these cannot be determined from the verbal discourse. For this reason, we abandoned the use of the term 'objective' as a teacher's goal. By the same token, the objective of a venture is not to be considered the same thing as learning outcome. It is not possible to tell from the verbal discourse what, if anything, is learned by the student from the verbal exchanges taking place. Of course, the discourse contains a number of facts, concepts, principles, etc., but to conclude from this fact that the student is learning thus-and-so from the exchange is to engage in conjecture.

What is meant by saying that a venture has an objective? As one reads the discourse in a venture it becomes clear that the venture has a central point. There is a sort of conclusion to which the verbal exchanges lead, a sort of theme that seems to pervade the exchanges, This constitutes the import of the venture, and it is its import that we have in mind when we speak of the venture's objective. In the preceding chapter, it was indicated that one of the conditions of a venture is that it have an objective, and we spoke of it as being a content objective. The expression 'content objective' was chosen deliberately to indicate that we had in mind the cognitive import of the discourse rather than the intentions of the teacher or the student's achievement. When we speak, then, of an objective in reference to a venture, we have in mind what a reader would grasp as the central meaning of a segment of discussion.

Using the term 'objective' in this sense, we classified the ventures in accordance with their cognitive imports. A sample of ventures was analyzed by a team of three members of the project staff,

each member reading the same set and arriving at his own interpretation of the import of each venture. Then the members met and discussed their individual interpretations. Following these preliminary explorations, one member of the team was given the task of formulating a set of categories into which ventures could be classified. Then the categories and their criteria were refined by further testing them out with other ventures until they were ready to be used.

Types of Ventures

Eight types of ventures were identified according to their objectives as follows: causal, conceptual, evaluative, particular, interpretative, procedural, reason, and rule.

Causal venture. The overarching content objective of this type of venture is a cause-effect relationship between particular events or between classes of events. Discussion in such a venture may center on distinguishing one or more causes of an event, or it may center on disclosing one or more effects of an event. Not only do ventures of this type contain statements that one event is a cause of another, but they often contain arguments supporting these statements. A cause of an event, in the sense in which 'cause' is used here, need be neither necessary nor sufficient to bring about the event. It may be only one factor contributing to or facilitating the event's occurrence.

The example below is a causal venture that occurred in a chemistry class.

Example 1

T: I want to skip over one and go down to number eleven. I'd like to see what some of you got for an answer. "Calcium hydroxide with nitric acid." Usually when we neutralize that, and that's what we tend to indicate here, we should get--salt and water.

S: That's right.

T: Salt and water. He has on the board, $Ca(OH)_2$ $2HNO_3$ produces calcium nitrate--$Ca(NO_3)_2$ water. Should that reaction go to completion? If so, why? In other words, is this action continued here until you use up all of this material in order to get this? What causes the action to go completely to the right rather than reverse?

S: The water.

T: Because of the water. Why water? I mean, why would a formation of water prevent the reversal in this equation?

S: Well--

T: Richard.

R: Well, we take the hydrogen ions and we put it into a compound and it would be able to be released again to go back.

T: What's--what did we find out about the ionization of water?

S: It's sort of made up by electrolysis.

T: Very--?

S: It's stable. It--

T: Very little ionization, so we have--water formed in this chemical reaction, as a result; it will go to completion and go in this direction, completely. Because once the water is formed, it is said that--what was it, one part in a million or something is ionized? Something like that. I don't exactly remember the figures on that. Anyway, very slight.

The focus of discussion is the question of identifying the event that causes a chemical reaction between calcium hydroxide and nitric acid to go to completion. The event cited as the cause is the formation of water. Thus, the content objective of this venture is the cause-effect relationship between the formation of water and the reaction's going to completion.

Consider the argument given to support the contention that the formation of water is the cause of the reaction's going to completion. A student states, in effect, that if hydrogen becomes part of a compound which releases hydrogen ions, the ions can go back, i.e., the reaction can reverse. The teacher then gets him to bring out the fact that water is very stable -- it ionizes very little. Finally, the conclusion is drawn that the reaction's going to completion is a result of the formation of water.

Conceptual ventures. The overarching objective of this type of venture is a set of conditions either governing, or implied by, the use of a term. These conditions constitute criteria for determining whether something is or is not a member of the class of things referred to by the term. A concept involves a class of things and the criteria by which members of the class are identified. Typically, a conceptual venture contains a concept's name and other aspects such as criteria and instances.

The following example occurred in a biology class.

Example 2

T: What is the mid-brain? What is the mid-brain? Sharon?

S: The smallest portion of the human brain.

T: All right. It's the smallest part, but where's it located?

S: Just above the pons and the cerebellum?

T: Yes. As we move up, we would find under here a pons--these crossed nerve fibers, and then on up above that, we will find a mid-brain, which is made of what kind of material?

S: Nerve fibers?

T: Nerve fibers. And what would be its function?

S: It, I imagine, would carry messages from the cerebral hemisphere and from the pons and stuff? The pons.

T: All right, it will also be a pathway or a conductor for impulses. We would also find that it will be a sort of connecting link or a binding tissue for the cerebrum with the cerebellum--or just below the cerebellum.

The objective of this venture is the conditions governing the use of the term 'mid-brain.' The discussion as a whole discloses these conditions through statements describing the class of things referred to by the term 'mid-brain.' These conditions are as follows: (1) It is the smallest portion of the human brain; (2) it is just above the pons; (3) it consists of nerve fibers; (4) it is a pathway or conductor for impulses; and (5) it links the cerebrum with the cerebellum.

Evaluative ventures. The objective of this type of venture is a rating of an action, object, event, policy, or practice; or a rating of a class of such things with respect to its worth, correctness, and the like. Discussion in ventures of this type usually attempts to determine whether or not some action, etc., is to be placed in a particular value category.

The evaluative venture represented by the discourse below occurred in an 11th grade English class.

Example 3

(1) T: Is is fair for an author to use emotional appeal in which to promote his argument?

(2) S: I think it definitely is, because if things [garbled] appeal, and if you can't get people interested in emotion then you can't promote a cause. Once you get people interested, then you can appeal to their reason also.

(3) T: You have to get their attention first by appealing to their emotions?

(4) S: I think you do.

(5) T: And then your appeal to reason? How about that? You don't seem to agree, Mary, shaking your head very disapprovingly.

(6) S: I don't agree. I think that--when something--it depends upon what type of a person you're talking to. I mean, like, if you were talking to a man such as [names school principal] he wouldn't like it because in more of an emotional way--if you were trying to promote something. He would--he would--he would want the concrete facts, and then that's the way you would persuade him.

(7) T: Well, now, Mary, suppose you were seated on the bench down there by the clock in the back lobby and you were crying your little heart out and [names school principal] would come along, and he would look at you. What do you suppose would happen to him when he saw a pretty girl crying her heart out?

(8) S: Well, he'd come over and--

(9) T: And he'd ask you what's the trouble, and suppose it was because [names herself] had given you a two on a test when you thought you ought to have a one. What kind of an appeal would you be making to [names principal again]?

(10) S: It wouldn't be a very good appeal.

(11) T: It might be a most successful one. A very good one--for our emotional appeal. Is it possible that I might be hearing from [names school principal]?

(12) S: You could.

(13) T: Well, fortunately, I have not had this experience as far as you are concerned. But I have heard from [names school principal] on occasion when some student felt that I have been unfair, or that I have misunderstood something and--the appeal has been an emotional one. And very often, when the three of us get together and work out the reason for the two instead of the one, and we all become very intellectual in our analysis of the problem, sometimes it wasn't so bad after all.

The objective of this venture is the evaluative judgment that using emotional appeal to promote an argument is fair if the ultimate appeal is intellectual. All of the statements in the venture are relevant to supporting or refuting this judgment. In the second utterance a student supports this evaluation. He says, in effect, that emotional appeal is fair because it is the only effective way of getting people sufficiently interested in a cause to be able to make an appeal to their reason. Another student, in utterance six, undermines this argument by denying that an emotional appeal is effective in all cases. The rest of the venture is devoted to determining whether or not an emotional appeal is generally effective. The conclusion seems to be that it is effective and thus the argument for its being fair stands.

Particular ventures. The particular venture has as its objective a body of information which clarifies or amplifies a specified topic or group of related topics. The central concern of the discussion in this type of venture is the answering of questions such as "What happened?" "When did it happen?" "What did it do?" "Who or what did it?" or "What is it like?"

The particular venture represented by the following discourse occurred in a history class.

Example 4

T: When they adopted their resolution concerning war, there were four specific points that Congress made. The first one had to do with Cuba. What did they say about Cuba?

S: I don't remember that.

T: Now what were they concerned about, do you remember? The important things for Cuba--the United States was going to do?

S: Well, they were going to give her independence.

T: That's right. They would recognize her independence--that she was free from Spain. Now, in order for her to be free, the second thing had to be carried out. What was that?

S: Well, we said that we had no ideas of annexing her.

T: That's part of it. That was the fourth thing, not the second. That's the Teller Resolution. Before we would agree that we wouldn't annex her, and before she could be free, something else had to happen.

S: The Spanish had to withdraw from the island.

T: That's right. Spain would have to leave the island. Then the third thing?

S: Was that--that they would have to form a constitutional type of government?

T: Not yet. How were we going to be sure that Spain would get out of the island? That's the third. We're going to keep Spain out of the island. Now, how are we going to do it? This is what brought war. Well, how could you force Spain to leave the island?

S: Wouldn't you send an army?

T: Why, of course! Here's the military and naval forces of the United States to enforce the resolution, which actually, of course, was the declaration for war.

The objective of this venture is a body of information concerning the provisions of a particular resolution passed by the Congress of the United States shortly before the Spanish-American war. The discussion as a whole is devoted to disclosing the contents of this resolution. The teacher initiates discussion by noting that the resolution had four provisions. The remainder of the discussion is concerned with describing these points.

Interpretative ventures. The objective of this type of venture is the meaning or significance of a set of words or symbols.

The following example of an interpretative venture occurred in an English class studying a novel by Alan Paton.

Example 5

T: All right, let's see what the next vignette brings out. Would you like to read this one for me, please?

S: I believe so. [Reading] "I say we shall always have native crimes to fear until the native people of this country have worthy purposes to inspire them and worthy goals to work for. For it's only because they see neither purpose nor goal that they turn to drink and crime and prostitution. Which do we prefer? A law-abiding, industrious, and purposeful native people, or a lawless, idle, and purposeless people? The truth is that we do not know, for we fear them both. And so long as we vacillate, so long will we pay dearly for the dubious pleasure of not having to make up our minds. And the answer does not lie, except temporarily, in more police and more protection."

T: All right. Now, here we have someone answering the earlier speaker. But what do you think is his plan? 'Which do we prefer? A law-abiding, industrious, and purposeful native people or a lawless, idle, and purposeless people.'

S: Well, I think that he's giving them a choice--more or less giving them something to think about, and his idea isn't all--[inaudible]. He thinks the black people should have something that they can work for--so that the ones who work in the mines or the ones who don't, find work.

S: Well, it seems to me that--that they see good in both, but this man recognized that the black people who are educated do realize that they will take a place in the government and so forth, and the white people [inaudible] and also . . . but they fear . . . like you said.

T: All right.

S: Well--he's giving them a choice of just two things and there's more of a choice here than just these two things. There's a choice of peaceful coexistence that he's not talking about here. That they work together intelligently and cooperatively. He's just saying that if they have one choice where they're not going to do anything, we'll have lawlessness or else we'll have another choice of where they're very progressive and the only one thing that they'll overrun us.

The discussion as a whole attempts to bring out the meaning of a paragraph in Alan Paton's novel. The paragraph is read and the teacher asks the class to tell the plan of the person speaking in the paragraph. Each student attempts to restate what the speaker is saying or to tell what is implied by what the speaker is saying. The utterances of the first two students are somewhat garbled in the transcription, but apparently both students are attempting to state the meaning of the passage. The clearest statement of its significance is given by the last student. According to him, the speaker is saying that the people can choose to do nothing, and lawlessness will continue, or they can choose a path which would result in a progressive native people who will overrun them.

Procedural ventures. A venture of this type discloses a sequence of actions by which an end may be achieved. The sequence of actions may be related to solving a problem, making a product, or bringing about a certain type of event. Thus, a venture may set forth procedures for calculating the coefficient of friction in certain types of situations, for baking a cake, for constructing an argument, or for applying for a job.

The procedural venture given below was taken from a physics class:

Example 6

T: While Alan's putting that on I would like to work out at least one sample problem on friction. As we said many times that, generally speaking, there is more than one method by which you can solve the problem. Well, not--let's see. Here's the problem. Why don't you use it for an illustration? Have a horizontal surface--the block--of ten pounds, making an angle of thirty degrees with the horizontal. Now, this block could either be at rest or it could be moving with constant velocity. In either case, it would be in equilibrium. Now, let's see--what else do you know about this? We know that the coefficient of friction between the two surfaces here--Mu [μ]--is equal to five-tenths--0.5 [Writes on board] Find--the weight of the block. Now, I believe this is all we have given on this. I hope you can solve it. We are to find the weight of the block; given the coefficient of friction, the pull of ten pounds at this angle of thirty degrees on the horizontal, and that the block is also in equilibrium. Now--you remember--we pointed out a couple of times over here--the general technique which you use in solving a problem of this nature. Whenever we have a point that can be considered as being in equilibrium, the first thing we do is to pick out that point which is the equilibrium. And the logical one to take here would be--well, what is that point?

S: Center of gravity.

T: Center of gravity! The center of gravity is one. Then the next thing we'd use is to--what?

S: How the forces are acting upon it.

T: Show all the forces acting upon that point. All right. Now, we had shown the given force acting on the point. What are the other forces acting on this point? [Center of gravity.] Well, we had the weight of the block--which is the unknown we want to find, we had the normal force of the surface on the block. If the block is pushing down on the surface, the surface must be pushing upward on the block. If that weren't true, why, they'd sink right down through the--all these blocks over here would push right down through the table top! This block has weight. We put it on the surface of the table; there is a downward force on the table due to the weight of this block. The table pushes back with an equal force. We have horizontal surfaces here; so we would show the normal force, say--in this fashion--but the normal force and the weight will not be equal, since we had a vertical component of this ten-pound force [10 lb. pull]--now we'll take care of those components--the ten-pound force--in just a minute.

Let's show the other force acting on this block. I think the force is what?

S: Friction.

T: Friction! The force is friction. So we can show the force of friction as being a--what kind of a force? Retarding, [force] acting in this direction. [150° angle, on the horizontal from the pull]. We'll call that F. [Writes on board.] Now we have this--the downward force, W, --the upward--the upward normal force N, the retarding force of friction, F, and the given pull of ten pounds acting at that angle [30° from the horizontal]. Now, we can resolve this inclined force [in pounds at 30° angle] with horizontal and vertical components, and if we do that we'll have an upward force here and a horizontal force like so [on block]. The horizontal force will have what value in terms of the ten pounds at this angle? What's the value of this horizontal component force.

S: Ten pounds times the cosine of the angle.

T: Ten pounds times the cosine of--

S: Thirty!

T: Thirty degrees. O.K. What's the value of this vertical component?

S: Ten pounds times the sine of thirty degrees!

T: Ten pounds times--uh--sine thirty degrees. Now, we can draw our axis through that point [0] and everything falls--all the forces fall on the axis [x, y]. O.K. [Writes on board.] If this drop is--uh--or this point that--uh--the block or the center of gravity is at equilibrium--then the sum of the X components will equal zero, and the sum of the Y components will also equal zero.

T: O.K. Now let's look--let's look at this F. What does it equal?

S: Five tenths.

T? What?

S: Five tenths N.

T: Oh! O.K.--O.K! I didn't hear you. Point five. Five tenths. So, we can eliminate one of those now [unknowns] and think in terms of something else. So let's write--re-write the first equation. Ten pounds times cosine thirty degrees, minus five tenths N equals zero.

O.K., let's solve for N. We're--we're done with the physics now. This is all the physics there is. We have described the physics of the situation in terms of two mathematical equations. Now the rest is just--uh--arithmetic-- [student interrupts].

S: With algebra?

T: Let's dignify it by calling it--uh--algebra instead of arithmetic. But all the physics is worked--we're through with all the physics now.

Now, I--I want to--uh--I want to emphasize this! Some of you are going to need extra credit problems--and--uh--you're doing it in such a terrifically hard way. Of course, I know you're trying to build up your points--[but] that isn't my purpose in giving the extra credit problems. I want you to get practice in analyzing the--the situations you get into in physics. And some of you are going through geometrical gyrations which--uh--floor me! They must--you must take hours doing some of this stuff. Now, if you had mastered this general technique of choosing a point that's an equilibrium--showing all of the forces that are acting upon that point--then take those forces in terms of given data--set up equations like those you have written over here, based on the fact the point is in equilibrium--the sum of the--uh--X components and the sum of the Y components will be equal to zero. And if you have any moments involved--you got any--have any parts--why those must also be equal to zero--the sum of the parts must be equal to zero and you can just solve all kinds of problems with that general technique.

The objective of this venture is a procedure for solving certain types of problems regarding friction. The teacher leads the class through a particular problem in which the coefficient of friction between a block and a plane, the amount of pull on the block, the angle of the pull, and the fact that the block is in equilibrium are given and the weight of the block is to be found. As the class works through the problem, the teacher points out the steps in a procedure which may be used in working other problems of this sort. The procedure, as finally summarized by the teacher, includes choosing a point that is in equilibrium, showing all the forces acting on that point, setting up equations based on the fact that the point is in equilibrium and then solving for the unknown.

Reason ventures. A venture falling into this category discloses the reason or reasons for an action, decision, policy, or practice. As used here, the term 'reason' refers to a consideration which leads a person to perform an action or which justifies his performing the action. Reasons include the purpose of the actor, the beliefs of the actor concerning the sort of action that would achieve his purpose, and rules governing actions of the sort undertaken by the actor. Generally, the discussion in this type of venture not only includes statements of the reasons, but also statements supporting the contention that these are the reasons for the action.

The example below is a reason venture which occurred in an English class studying a novel by Graham Greene.

Example 7

(1) T: Why was Graham Greene interested in these cockroaches?

(2) S: It sounds like a bunch of "cruddy" Englishmen to--

(3) T: Just a minute!

(4) S: He doesn't--[inaudible].

(5) T: Huh?

(6) S: He doesn't have anything to do with the palm reading.

(7) T: Uh--that's right. [Several people are talking.] He does as little playing and pälm reading as possible. Barbara?

(8) S: I don't know. I thought that after all this--heavy morality, this might be added for color.

(9) T: This is what Tom said.

(10) S: I don't know, it's--completely [unclear].

(11) S: --because they didn't have anything else to do.

(12) T: Don't you think he wanted to show how very desperate those people were for something to do?

(13) S: Yes.

(14) T: They are driven to these cockroach fights; and it's not just a casual cockroach fight, is it?

(15) S: Well, no. It's pretty serious.

(16) T: They're--it's really serious then--it becomes serious only in a place like this, doesn't it?

(17) S: Yes.

(18) T: These people wouldn't--consider this something that, in a way, it is--is a thing to do. For example, here in our town, they wouldn't consider killing flies to pass the time. When they get angry, they wouldn't want to beat each other, would they? Only in this dismal, oppressive place.

The objective of this venture is the reason Graham Greene was interested in cockroaches, i.e., the reason he introduced episodes concerning cockroaches into the novel. The discussion as a whole is devoted to bringing out the purpose Greene had for doing this. In utterance eight a student says that he did it to add color. The teacher, in utterance twelve, suggests that his purpose was to show how desperate the people were for something to do. In support of this suggestion, the teacher goes on to point out that the people were driven to the cockroach fights. It was not a casual affair, but a serious one. She concludes the argument by saying that such a thing as a cockroach fight becomes serious only in a dismal, oppressive place such as the one these people lived in. These arguments indicate that it is reasonable to ascribe to Greene the purpose of showing how desperate these people were for something to do.

Rule ventures. The objective of this type of venture is a rule or several related rules. The term 'rule' as it is used here refers to conventional ways of doing things and to analytic relationships which may be used to guide actions. Thus, rules include such things as rules of grammar, rules for playing a game, laws of a state, mathematical equations such as area = base x height, and theorems of geometry. A prescription stating what action is to be taken to achieve a given end is not a rule. It is a matter of empirical fact rather than a convention that the action achieves the end. Thus, the statement, "Soak cloth in cold water to remove bloodstains from it," is not a rule in the sense in which the term 'rule' is being used here.

The rule venture which follows was taken from a class studying English grammar.

Example 8

T: We have a word that causes trouble--just a little bit of trouble, and it's a little word, too. [Writes 'a' and 'and'] How would you decide which of those two words to use? Harry?

S: If it describes the subject it is plural?

T: It's plural. Which one do you use as plural?

S: 'A'--I mean 'an'.

T: You mean you're going to use 'an' with a plural subject and 'a' for a singular subject. Is that what you're saying?

S: Yes.

T: Well, let's see. Uh--you're going to use 'an' for the plural subject. Is that what you meant? Well, I'm going to say 'an apples are good for us,' and 'a apple.' Is that what you mean? 'A' with one apple and 'an' with more than one apple?

S: No. It's the opposite?

T: I don't know. That won't help a bit if I turn them around, will it? All right, explain these two words.

S: Use 'a' before a word that begins with a consonant, like car, and 'an' with apple--with vowels.

T: Yes. That is the point. Use 'an' before vowel sounds. What are the vowels?

S: A, E, I, O, U.

T: When a word begins with a vowel or a word has a vowel sound. For instance, we have words that begin--some words that begin with H--as 'honest' has a vowel sound even though it begins with a consonant, so you talk about 'an honest man.' The words beginning with vowel sounds should have 'an' rather than 'a'. Now, let's see if you can--uh--show us that you know that difference. On page 351 of the text put just 'a' or 'an' before these words. The first one?

S: An easy job.

T: Miriam?

S: A hard job.

T: Marie?

S: An onion.

T: Sam?

S: A hotel.

T: Alan?

S: An hour.

T: Sharon?

S: A sentence.

The objective of this venture is the two related rules governing the use of 'a' and 'an.' Discussion is initiated by the teacher's question, "How would you decide which of those two words ['a' and 'an'] to use?" A student attempts to state rules for deciding which word to use, but gives incorrect rules. The correct rules are stated by another student who says, "Use 'a' before a word that begins with a consonant, like 'car' and use 'an' with 'apple'--with vowels." The teacher amends the rules somewhat, and then students use the rules to decide in a number of particular cases whether to use 'a' or 'an.'

Chapter IV

THE RELIABILITY OF THE CRITERIA

The problem of assessing the reliability of the criteria for classifying ventures is similar to the problem of assessing the reliability of the procedures for identifying ventures. In both cases, the reliability is assessed in terms of the degree of agreement in the use of the criteria by independent judges.

Here, too, a simple descriptive measure of agreement was used. The coefficient of agreement used to indicate the reliability of each category involved comparing the number of agreed uses of a category with the total number of times both of two teams used that category. The formula used was:

$$C_x = \frac{A_1 + A_2}{B_1 + B_2}$$

where C_x represents the proportion of agreement in using category X; A_1 represents the number of ventures which team 1 judged to be in category X when team 2 made the same judgment; A_2 represents the number of ventures which team 2 judged to be in category X when team 1 made the same judgment; B_1 represents the total number of ventures which team 1 judged to be in category X; and B_2 represents the total number of ventures which team 2 judged to be in category X.

This coefficient of agreement is interpreted in essentially the same way as that used to assess the reliability of procedures for identifying ventures; briefly, that 70% (or higher) agreement is satisfactory for our purposes (cf. Chapter II).

The procedure used was as follows: Four graduate students (two in mathematics, one in social studies, one in education), not associated with the development of the criteria, were trained to use the criteria with two sample sets of ventures.

The training procedure consisted of two phases. In the first phase the judges classified a sample set of four ventures in cooperation with the three members of the project staff who developed the criteria. The set of instructions for using the criteria was discussed with the judges during this phase. In the second phase, the judges classified a further sample set of eight ventures (one venture from each of the eight categories), at first independently, and then as two teams of two judges each. A final meeting with the project staff was held for comparison of individual and team judgments and discussion of difficulties.

Finally, the judges classified a set of 28 ventures selected to represent each of the eight categories. (The set was selected from 170 ventures which had been tentatively classified by the project staff.) The judges were instructed to work independently and then meet in prearranged pairs to discuss their classifications and agree on team judgments. Each team reported their individual judgments as well as their team judgment.

Of the 28 ventures in the sample, 22 (79%) were judged to be in the same category by the two teams. On the other six ventures the team judgments were in disagreement.

The coefficients of agreement for each category are presented in Table 3.

Table 3. Proportions of Agreement Between Teams in the Use of Each Category

Type of Venture Agreed Upon	Coefficients of Agreement
1. Causal	.00*
2. Reason	.67
3. Conceptual	.75
4. Evaluative	.75
5. Particular	.75
6. Interpretative	.67
7. Procedural	.80
8. Rule	.86

* When the Causal and Reason categories--which are not customarily distinguished in the language and are thus easily confused by naive judges--are combined, the proportion of agreement for the combined categories is .80.

Except for the Causal category, the proportions of agreement range from .67 (Reason and Interpretative categories) to .86 (Rule category), with a median of .75.

These results suggest--except for the Causal category--that there are no marked differences in the relative reliability of each major category, and that, over all, three out of four ventures are classified in the same category by both pairs of judges. Thus, this level of agreement indicates that the categories are satisfactory for our purposes.

As a check on the use of the criteria by the project staff, the agreement between the classification of the sample set of ventures by the independent judges and the classification of the same ventures by the project staff was calculated. The number of agreed judgments is represented as a proportion of the possible total number of agreed judgments in Table 4.

Table 4. Proportions of Agreement Between Independent Judges and Project Staff

Type of venture as classified by project staff	Proportion of ventures classified in the same category by individual judges	Proportion of ventures classified in the same category by pairs of judges
1. Causal	.25*	.17*
2. Reason	.75	1.00
3. Conceptual	.75	.88
4. Evaluative	.67	.83
5. Particular	1.00	1.00
6. Interpretative	.75	.63
7. Procedural	1.00	1.00
8. Rule	.94	.87

* Combining the Causal and Reason categories, as in Table 3, yields .83 and .75 for the left and right columns, respectively.

These results suggest considerable agreement between the project staff's use of the criteria and the judgments made by independent judges. They also show that team judgments were not consistently closer to the project staff's classification than were individual judgments.

Experience obtained during the training procedure suggested that the disagreement between the judges could be attributed to three somewhat distinct sources.

The first source of disagreement is in the nature of the criteria for the categories. Every attempt was made to clarify the distinctions between categories, but some of these distinctions are not customary in ordinary language and were difficult for the judges to make. In particular, the distinction between the Causal and Reason categories was of this kind.

The second source of disagreement arises from difficulties in deciding what should be classified. Skill is required in identifying the overarching content objective of a venture. The theme which unifies the discourse contained in a venture must be isolated from introductory and subsidiary themes, and from the specific techniques which are employed to maintain the central theme. The set of instructions and training procedures may not have been adequate to develop this skill.

The third source of disagreement arises from the nature of the discourse contained in some ventures, and not from the lack of skill of the judges. In a few ventures the general topic may be clear, but the teacher and students seem to be talking to no particular point. Individual utterances may be so disjointed, and so lacking in any apparent pattern, that judgments concerning the overarching content objective are very difficult to make. In such cases it is usually possible, after careful reading and rereading, to arrive at a conclusion as to the most probable content objective. But judges unused to reading transcribed recordings of classroom discourse are likely to find this a difficult procedure.

The procedure used did not make it possible to isolate the relative contributions of these sources of disagreement, but the results suggest that the criteria which have been developed, with the instructions for their use, can be used by independent judges with a reasonable degree of uniformity.

Chapter V

STRATEGIES AND MOVES

In the preceding chapters it was seen that each type of venture is characterized by a particular type of objective. For example, conceptual ventures are characterized by the fact that they embrace an analysis of a concept; interpretative ventures set forth various meanings of an expression, object, etc.; a causal venture presents the antecedent conditions that account for a phenomenon.

Each venture contains certain verbal activities that are to be understood as ways of obtaining the venture's objective. One of the problems we face in making an analysis of teaching behavior is that of how to conceive of these activities.

The Concept of Strategy

One of the current conceptions used to describe the activities by which certain ends are attained is the notion of strategy. This conception is to be found in game theory as well as in military science and it is coming to be used in discussions of international relations, collective bargaining, and other situations in which there are conflicts of one sort or another.

The classroom involves a teacher and a number of students in situations where objectives are to be attained through the actions of the teacher, often in the face of such resistances as conflicting motivations and cognitive strains. It is only natural that the concept of strategy should come to our attention and be considered as a way of looking at the activities involved in classroom discourse.

There are two sorts of situations where the activities of an individual determine, in some measure, the outcomes. First are those situations in which the outcome depends upon skill or chance, as in the game of dice or dart-throwing. Second are those situations where the outcomes depend not merely upon skill or knowledge but also on the action which a participant expects those who oppose him to take, and which he knows depends, in turn, on what expectations the opposition has of his own actions. Strategy is not involved in the first of these situations, but it is in the second.

Situations of strategy appear to fall into at least two types. There are, first of all, those situations that involve the application of force in an effort to obtain an objective in the face of determined opposition. In such a situation there is pure conflict, because the interests of the opposing individuals or groups are divergent. This sort of situation is illustrated in such social games as checkers or chess, and in large social operations by military conquest. The goal is complete paralysis and destruction of the enemy, or else, as in a social game, to win the contest while leaving the enemy intact. For example, in the Second World War the goal of the German military leaders was to paralyze and annihilate the enemy. Their strategy was to break through enemy lines in an overwhelming power drive and then to encircle the disintegrated elements of the enemy's forces and to annihilate them one by one as rapidly as possible. This strategy also took a second form; namely, to pin down the enemy by frontal assault and then, by overwhelming attacks on his flanks, to storm forward and encircle the enemy by joining hands behind him.

The second situation of strategy is one where force is not actually applied but used to threaten and to intimidate the enemy in such a way as to influence his action. Situations of this type rely upon an exploitation of potential force without the actual application of it. Such situations are illustrated by collective bargaining and in the cold war between the East and the West. There may be gains and losses for either side without complete victory. Where there is a possible outcome conceived to be worse for both parties, as in the case of atomic warfare, compromises may be made in the interest of avoiding mutual disaster and gaining, instead, outcomes advantageous to each side. It is often the case that gain for one side means loss for the other. But even so, there is some sort of common interest in reaching outcomes which are at least mutually advantageous because the worst possible outcome is avoided.

To sum up, strategy situations seem to be of two kinds as identified in terms of conflicts and goals. In one sort of situation, interests of the contending parties are in conflict and the goals are different. In other situations, the interests are in conflict but there are mutual advantages in the realization of certain goals. Thus, in a bargaining situation, the interests of labor and management are in conflict but their goals are overlapping in the sense that it is to their mutual advantage to keep the industry going or, at least, to forestall any prolonged shut-down of its machinery.

The question arises as to whether or not situations characterized by ventures resemble either of these two situations of strategy.

They are similar in that there are ends to be attained and means are to be used in attaining them. They are alike, also, because the teacher and the students do not always see things alike and hence the discourse sometimes exhibits differences of motivation, information, and opinion. But the similarities end here and differences begin. The venture is different from the foregoing situations of strategy in at least three respects. For one thing, the outcomes are advantageous to the student and they represent no loss for the teacher. Both parties in the situation stand to profit from its outcome without sustaining losses. For another thing, unlike the other strategy situations, the parties are in no sense peers. The authority relationship in the venture is one in which one party--the teacher--is always in a position of greater influence than the other--the student. For still another thing, both teacher and student typically become engaged in a cooperative activity that takes the student into the domain of knowledge possessed by the teacher.

Although there are differences between teaching situations and situations of strategy such as those described in the preceding pages, they are similar enough to justify using the concept of strategy in analyzing verbal teaching behavior.

Pedagogically, strategy refers to a set of verbal actions that serves to attain certain results and to guard against others. From a general standpoint, strategies may serve to induce students to engage in verbal exchange, to ensure that certain points in the discourse will be made clear, and to reduce the number of irrelevant or wrong responses as the students participate in discussion, and so on.

Of course, strategies also enhance the possibility that the cognitive import of a venture will be attained; that is to say, that objectives such as explication of concepts, elaboration of causal conditions, and the presentation of information will be successfully carried out.

There are two important dimensions of verbal activity that the teacher manipulates in carrying out a strategy. One of these dimensions concerns the type and sequence of operations that the teacher and the students jointly enter into in setting forth and structuring information in such a way as to disclose the content that is to be learned. The other dimension has to do with the operations the teacher uses to guide and control the participation of students in performing these operations on the content. These two dimensions we call respectively the treatment and the control dimensions of strategy.

The control dimension is illustrated by a series of questions which tend to prevent exploration of the matters in hand and which, step by step, narrows down the possibility of responses until the student is finally driven to an answer which the teacher had predetermined in his own mind. This sort of control frames a student, so to speak, by leading him through a series of questions from which there is no exit save one provided by the teacher. Or again, a teacher may wish to engage his students in discussion that has as its purpose the exchange of ideas in such a way that the students learn to participate intelligently and to challenge each other at higher levels of rational discourse rather than to attain a content objective. To accomplish this end, the teacher may involve his students by raising questions that are contrary to fact. He may ask what might have been the future of the United States had the English government under George III been more astute and, in consequence, the American Revolution had not occurred. There is no correct answer to this question because the evidence needed to supply such an answer is not available and cannot be made available. But students can make conjectures and defend these on rational grounds, presenting such evidence as will make their guesses plausible. In this case, the control consists in raising a question for which there can be no correct answer and in checking the reasoning of students at points where it may seem to go awry. This dimension of strategy is designed to engage the students in an exchange of ideas rather than to teach substantive learnings. The teacher is more concerned to evoke the behavior of students than to deal with the content of instruction.

The treatment dimension is primarily concerned with the explication of concepts, the analysis of causal conditions, and the like. Here the teacher is involved more with the content of instruction than with the behavior of students. The treatment he employs will be influenced more by the requirements of the content than by student behavior. The teacher will, therefore, raise questions that will tend to focus attention on elements of knowledge deemed to be essential in the exploration of the instructional materials to be discussed. His verbal activities will be designed to bring out relationships among concepts and principles and to explore concepts and principles in such a way as to make their meaning explicit.

While these two dimensions are interrelated they are not interdependent. The same treatment can be used with a variety of controls and vice versa. In order to simplify the task of analysis, one must decide which dimension he will focus upon. Having done this, he will be in a better position to study the interrelationships of these two dimensions of strategy. The treatment dimension is given priority in our analysis. In the first place, knowledge of the operations which teachers and students enter into in dealing with content should make it easier to identify and describe the ways in which the teacher guides and controls the activities of students in the performance of these operations. In the second place, our investigation of the logical structure of teaching was primarily concerned with verbal behavior as it is related to the manipulation and control of content. It is to be expected that in a study of strategies this concern would be continued because of the cumulative effect of a series of investigations that pursue the same general ends. In the third place, an investigation of the control dimension of strategies would engage us in a study of the affective aspects of teaching behavior that we have not considered in our analysis of teaching, although it is of great importance and is a central feature of a number of studies by other workers.

Moves and the Treatment Dimension of Strategy

The problem of identifying and describing the treatment dimension is, in part, a question of identifying the various kinds of verbal manipulations of the content of instruction. We refer to these as moves. Moves are verbal in character and they may be thought of as units of content as well as manipulations, depending upon whether one considers them as static or dynamic elements.

For each kind of venture it is possible to think of a basic schema that indicates essential features of discourse dealing with the venture's objective. Thus, if conceptual ventures are considered, the basic schema can be thought of as something like the following: "a, b, c are conditions governing the use of the term d, and d is applicable to certain objects x, y, z." The schema for analyzing information in causal ventures is "a causes b;" for evaluative ventures it is "a has the rating b."

Criteria were formulated to identify different types of moves in terms of their function in developing one or another aspect of the terms in the basic schemata. Thus, criteria for moves in causal ventures have reference to the cause, the effect, or the causal relationship. Analysis of the causal complex into its elements leads to additional types of moves. Thus, for example, the identification of a cause is often followed by an explication of the cause, and new criteria are needed to identify the moves involved in the relevant discourse. It is also necessary to formulate criteria for moves that do not fit this schema, as in the case of analogy sometimes used in causal ventures.

Perhaps an illustration will help to clarify the use of the term "move." One of the types of moves in concept ventures is the positive instance move. The criterion of this move is as follows: an instance or sub-class of the referent is noted or discussed. The following are examples of the positive instance move:

> The teacher has indicated that there are various biological misnomers, and has been mentioning some of these. The following positive instance moves then occur:
>
> Move 1
>
> T: Can you name any other animals that we usually refer to as fish, but they don't belong with the fish at all?
>
> S: The whale is a mammal. . .
>
> Move 2
>
> S: . . . The silverfish is an insect.
>
> T: Oh, we studied one and made a drawing of him.
>
> Move 3
>
> S: Crayfish.
>
> T: The crayfish. We talked about that a while ago . . .

In this example the teacher is eliciting the names of a number of animals that have the word "fish" as part of their name or that are usually referred to as fish. The general concept can be thought of as a class of things called biological misnomers, and these examples serve to exemplify the concept. "Whale," "silverfish," and "crayfish" are instances of the class. Thus, they serve to bring out the meaning of the term "biological misnomer" by providing instances of the class of things to which the term is used to refer.

Lest it appear that the identification of moves is a simple task of applying standard logical categories to segments of discourse, we shall give, for illustration, a thumbnail sketch of the procedure utilized in working out the criteria for causal ventures. The segments of discourse classified as causal ventures were studied by a team of two persons. A sample of ventures was selected for initial analysis. The team members, working together, read and discussed the moves as they were identified. Sometimes what was thought to be a move turned out to be part of a move; at other times a cluster of moves; or again, extraneous bits of information. But by successive approximations the team finally formulated a set of criteria. These were then used to analyze another set of ventures. On this occasion the team members worked independently, marking off the moves in each venture by a common set of symbols (usually lines to indicate the beginning and the end of a move). After these independent analyses had been made, the team met to review and discuss the markings of each venture. The criteria were discussed and revised as the points of disagreement in markings arose. By successive revisions of this order the criteria were defined to the point that the team members were able to analyze the ventures into moves with a fair degree of consistency.

The major problem in identifying moves in classroom discourse is that of deciding what has actually been said. An analyst is frequently confronted with discourse in which the teacher's questions are ambiguous, and even when they are relatively clear, students' responses are often obliquely relevant to the question. The analyst's task is to decide what has been said as distinct from what a teacher or student intended to say, or started to say. This is often a difficult undertaking and one which may lead to initial disagreement between analysts. Next, the analyst must decide upon the relation of what has been said to the topic of the venture. Here he is faced with a decision as to where reasonable boundaries can be drawn between different kinds of information. Two somewhat different bits of information may add up to something quite different when they are taken together instead of separately. The analyst must decide, from the context of the discussion, whether some parts are subsidiary to other parts, or independent units. Almost all of the disagreement between analysts in identifying the beginning and end of moves occurs when one judge sees a section of discourse as two separate moves while another sees the same section as a single move.

The final decision--the classification of a given section of discourse as a particular kind of move--is relatively simple. The major problems that occur at this stage arise when a section of discourse is not clearly one kind of move or another. There are so many subtle variations and kinds of information that it would be possible to construct a very large number of moves. Since the purpose of this analysis was not to develop a system for categorizing all aspects of classroom discourse, but rather to identify the major kinds of cognitive information in such discourse, the number of different kinds of moves has been kept as small as possible. One of the major difficulties faced by the project staff was how to avoid the tendency to continually add new kinds of moves. It is easy to become impressed with the apparent uniqueness of the information contained in any single bit of discourse. It is difficult to see the underlying similarities, and any analyst making use of this system must, in a sense, be forced to look for the similarities which exist.

The final point to be made here is the introduction of the technical term "play." Briefly, a play is a consecutive sequence of one or more moves of the same type. It may contain a small number of these moves or a large number. Suppose that the three positive instance moves given above are consecutive and are preceded and followed by moves of a different type. Then these three positive instance moves would form a single positive instance play.

The reason for introducing the notion of a play was that the unmodified move data were too complex to yield patterns. By using plays in the search for patterns some information is lost, but the compactness of the data is increased. Further, it should be seen that a play contains moves that serve the same function, and thus it is felt that the analysis in terms of plays more adequately reflects variations in the structure of the venture than does an analysis in terms of single moves.

Chapter VI

ANALYSIS OF CONCEPTUAL VENTURES

As we have defined it, the topic of a concept venture is some class or category of things (they might be objects, events, relationships, or sub-classes) and the name or phrase which is used to refer to that class or category. For example, concept ventures in English classes are about such things as "metaphors," "irony," and "romantic poetry;" in chemistry classes they are about such things as "alkali" and "chemical reaction;" in history classes, "imperialism" and "a tariff wall;" and in biology classes, "digestive system" and "a compound eye."

The discussion in concept ventures is concerned primarily with the explication of information about the concept. Typically, near the beginning of the venture, some question is asked about the concept in which it is referred to by name, and the ensuing discussion might be about what characterizes the concept, how it is related to other concepts, how you can identify instances, and so on. Sometimes the venture is relatively long, and there is discussion of a variety of different kinds of information about the concept. In other cases the venture is relatively short and the discussion is limited to explication of some particular aspect of the concept. While we have grouped all discussions of concepts into a single category, it is probably true that the nature of the discussion varies with the more general context of subject-matter development within which the venture occurs. For instance, at one time a teacher may be concerned with briefly reviewing the contents of a previous discussion, or the contents of some text material. At another time the teacher may be introducing new information for the first time, or helping students to deduce such information for themselves. Examination of the 210 concept ventures which were identified in the recorded discourse suggested that the teachers were concerned with providing students with additional information about a concept which was already known; with providing a new, or refined, meaning in place of erroneous or inadequate meanings which the students held; or, on relatively few occasions, with introducing the students to an entirely new concept.

A sharp distinction should be made between what we have identified as examples of the teaching of concepts, and what is usually referred to in the psychological literature as the "acquisition of concepts." In typical studies of concept acquisition (cf. the classic study by Bruner, Goodnow, and Austin, 1956), the investigator is concerned with a particular kind of behavior, namely the sorting or classifying of objects into appropriate categories.[1]

As a result of this, it has been typical for writers of texts in educational psychology to discuss the teaching of concepts as though it were the same as teaching a student to categorize objects. However, it is possible to learn a rule for making appropriate categorizations without ever learning much about the nature of the objects being classified, and it is evident from observation of what goes on in high school teaching that teachers are rarely, if ever, concerned with categorizing behavior per se. Nor are they more than occasionally concerned with teaching only those critical attributes which would allow students to make appropriate categorizations. Instead, teachers appear to be more concerned with the explication of the kind of information which results in students being able to describe the concept, to identify differences between the concept and some other concept, and to understand the concept in reading or learning about more advanced subject matter.

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[1] Bruner, Goodnow, and Austin (1956) refer to concept acquisition as "learning to categorize" (p. 21).

Examination of discussions of concepts in the classroom suggests that the psychological basis of the learning of concepts could be best described as the "acquisition of meaningful information,"[2] rather than "concept attainment," although undoubtedly, the psychological processes underlying categorizing behavior may sometimes be involved.

Kinds of Information About Concepts

The first step which was taken in our analysis of concept ventures was to list the kinds of information which constituted the content of the discourse. This list is given below. It should be noted that we found it necessary to make a distinction between the class or category referred to (the "referent"), and the term or phrase which was used to refer to it. In some ventures there was discussion of the term itself which provided no information about the nature of the class or category which the term referred to.

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[2] Ausubel (1966) provides an extended discussion of concept learning from this point of view.

Kinds of Information Disclosed in Discussion in Concept Ventures

1. A characteristic or quality the referent has.
2. A part the referent has.
3. A function the referent has.
4. A use that the referent has.
5. A characteristic treatment accorded to the referent.
6. A relationship between the referent and something else.
7. The way in which the referent compares with something else with respect to a single characteristic.
8. A condition which produces, or causes the referent.
9. A characteristic of the way in which the referent grows, develops, or changes.
10. A class of things to which the referent belongs.
11. An instance or sub-class that the concept has.
12. The results of some operation or procedure involving the referent.
13. A relationship between two or more characteristics of the referent.
14. A characteristic of the variables on which the referent depends.
15. The emotive or persuasive force which the term for the referent has.
16. The alternative ways in which the term for the referent may be used.
17. The difference between one use or meaning of the term for the referent, and some other use or meaning it may have.

This list is not inclusive of all the kinds of information about a concept which it might be important to teach, but it represents most of the kinds of information identified in our recordings of high school discourse.

Types of Concept Venture Moves

The next step was to identify and isolate the major differences which occurred in the way in which these kinds of information were presented or discussed. These appeared to be: (1) explication of information about or through the discussion of instances, (2) explication of information about or through the comparison of the primary concept with some other concept, and (3) the direct description of characteristics or qualities. Within each of these major categories we identified what appeared to be the basic strategic elements or "moves" which characterized the kinds of discussion occurring within the concept ventures. These are listed below.

The Moves Identified in Concept Ventures

I. Descriptive Moves

1. Characteristic move
2. Sufficient condition move
3. Classification move
4. Classificatory description move
5. Relations among characteristics move
6. Analysis move

II. Comparative Moves

7. Analogy move
8. Differentiation move
9. Instance comparison move

III. Instantial Moves

10. Positive instance move
11. Instance enumeration move
12. Negative instance move
13. Instance production move
14. Instance substantiation move

IV. Usage Moves

15. Meta distinction move

The Nature of Concept Venture Moves*

In this section, the nature of each of the different kinds of moves identified in concept ventures is described, and examples of each kind are given.

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* Most of the content of this section has been taken from Coombs, J. R., Teaching Strategies and the Teaching of Concepts (unpublished Ph.D. dissertation, University of Illinois, 1964).

1. Characteristic move. The content of this kind of move consists of noting or discussing some single characteristic or quality of the class of things which is being explicated. It should be noted that this kind of move is not said to occur whenever some characteristic or quality of the concept is referred to, but only when the characteristic is discussed directly, and not as part of some other operation such as comparing the concept with another concept or verifying the fact that an object is a positive instance.

The following is an example of a characteristic move which occurred in a discussion of the "cerebrum."

Example 1

T: The cerebrum. All right, the cerebrum of course is formed in what--what is its form--the cerebrum? What else goes with the cerebral--what?

S: Spheres.

T: Hemispheres. Cerebral hemispheres. In other words it is divided here--a rather deep impression which seems to divide it into two parts and we call them hemispheres.

The characteristic of the cerebrum which is brought out in this exchange is that it has a "rather deep impression" that divides it into two parts called hemispheres. In the next example, a characteristic of "adverbs" is described.

Example 2

T: What are adverbs supposed to do?

S: Modify verbs, adverbs, or adjectives.

T: Yes--you could say it that way. That'll take care of most of them. They will rarely modify a preposition, but usually they modify verbs, adjectives and other adverbs.

It is stated in this move that adverbs rarely modify prepositions, and usually modify verbs, adjectives and other adverbs. In this case the characteristic is the function of adverbs.

2. Sufficient conditions move. In this kind of move a set of conditions is represented as being sufficient to warrant the use of the class term. Typically, the teacher might ask a question of the form: "How would you identify X?," or "How would you know it was an X?" The set of conditions which are described in this kind of move may or may not be descriptive of the referent, since all that is required is a rule for knowing when an instance of the referent is present, or has occurred. For example, the following sufficient condition was described in a discussion of "equal figures" in a geometry class.

Example 3

S: Well, the median of a triangle divides it into two equal triangles.

T: All right, equal.

In this example, it is stated that when a triangle is divided by its median, you have two equal figures. In a discussion of "acids" in a chemistry class, the following sufficient condition was described.

Example 4

T: Now, if you were looking at the formula for it, and if I asked you to identify an acid by looking at the formula for it, could you?

S: It has ionizable hydrogen.

In this case what is described is a particular property which is sufficient to identify an acid in a specific context. Within one traditional view of chemistry, it is the one characteristic which is required to distinguish acids from other kinds of compounds.

3. Classification move. In this kind of move a class of things is named or described and it is stated that the referent falls within this class. In a discussion of "nerve impulse" the following classificatory move occurred.

Example 5

S: They're [nerve impulses] all a sort of electrical charge, isn't it?

The nerve impulse is said to be a case of an electrical charge. In a discussion of the concept of a "habit" the following exchange took place.

Example 6

T: Well, we spoke something about habits. What--how would you define a habit? Would it be one of these types of reflexes?

S: Yes, it'd be an acquired reflex.

T: Acquired reflex. Yes.

In this case, a habit is classified as a kind of acquired reflex. The physiology class from which this example was taken had just completed a discussion of different kinds of reflexes and this move, occurring at the beginning of a discussion of habits, served to relate the nature of habits to the nature of a particular kind of reflex. Many of the classification moves which were identified appeared to have had a similar function. By relating the concept being discussed to some larger class, they introduced something of what students already knew into their knowledge of the concept.

4. Classificatory description move. This kind of move may be seen as a combination of a classification move and a characteristic move. The result is a description of the referent in which it is uniquely identified as a specific sub-class of some larger class. Thus, it becomes a type of "genus differentia" definition.

In a discussion of the "fish's mouth," the following classificatory description move occurred.

Example 7

T: What about the [fish's] mouth? What can you tell us about it?

S: Well, it's the only organ through which both food and water enter.

T: Food and water.

In this move the referent of "mouth of fish" is identified as belonging to the class of things called "organs." It is further distinguished as the only type of thing within this class through which both food and water enter.

Like the sufficient conditions move, the classificatory description move may provide little or no information about what the referent is like. It provides a precise formulation of class boundaries, but not necessarily any description of what is to be expected within those boundaries. For instance, in the example given above there is no indication of what the referent is like, or where it is to be found. The effectiveness of these kinds of moves is probably greatest when the subject area is highly formalized, and the identification of instances of a referent is a necessary part in the development of a proof or argument. Perhaps the best example of this kind of situation is given in Example 3, above. There, a sufficient condition is given for the identification of equal figures in a particular situation. This sufficient condition would be important when it is necessary to identify equal figures so that certain properties of those figures can be used in deducing some desired conclusion, or completing a proof.

In this kind of situation characteristics such as how equal figures originate, what they often look like, where they are to be found, and so on, are completely irrelevant.

5. Relations among characteristics move. Moves of this type occur only when the term refers to a particular type of relationship between two variables which, when numerical values are given to the variables, can be expressed mathematically. Stating the criteria for such a relationship would include stating the variables involved in the relationship and the nature of the relationship, i.e., whether it is the product of the variables, the ratio between the variables, etc. In some cases the criteria may also include stating the conditions under which the relationship is constant, when it changes, and what might cause it to change.

One way of setting forth a relationship is merely to state that the relationship exists. Another way is to establish the relationship experimentally. A "relations among characteristics" move is a situation in which the nature of a relationship, or of one or other of the variables involved in the relationship, is established experimentally. The examples of this kind of move which were identified in the recorded concept ventures were all of considerable length. Consequently, the example given below is only the summary statement made by a teacher at the end of such a move in a physics class. Prior to this summary the teacher had performed several operations of pulling a block of a given weight over a horizontal surface, making appropriate measurements during the operations, and discussing them with the class.

Example 8

> T: Then we put the block--put the plane down in a horizontal position, like this, put the block on the plane, and using a spring balance to pull the block above the surface of the plane, and when we had a total downward force, block plus 1,000 grams, it required 310 grams to overcome the force of friction. Then I doubled the downward force on the block and I asked you to predict what force would be required to overcome friction, and most of you said about 600 grams, I guess. We tried and found that it required about 580 grams to overcome the force of friction. And someone said then that this might show that the force required to overcome friction varies directly as the downward force on the horizontal surface. Now, that is very limited data from which to draw a conclusion like that, but this is the way it turns out.

From this, it is concluded by the teacher that the "coefficient of friction" (which is the concept being developed) remains constant as the force required to overcome friction and downward (normal) force are directly related to each other.

This kind of move is obviously possible only in those situations in which it is possible to vary experimentally the variables involved in the relationship. As will be indicated in a later section, all cases of this kind of move were identified in physics classes.

6. Analysis move. In this kind of move a set of parts or constituents of the referent are listed or discussed. In those cases in which the parts function together in a system, the functional relationships between the parts may also be discussed. The following example is an analysis move made by a teacher during a discussion of the "brain stem." In this case, the parts are merely listed.

Example 9

T: And what would make up the brain stem? We have the medulla, the mid-brain, and the pons--make up the brain stem.

In the next example, the "respiratory system of the fish" is being discussed. Since the concept involved here is a system, the interrelationships of the parts is significant.

Example 10

S: I'll take the respiratory [system] and start with the mouth because water must be taken in--to dissolve--oxygen--enters through the mouth. Then it passes over a structure called the gills. On the gills you have the gill rakers--which keep all the water particles off the gill filaments and then these--uh--gill filaments which the water passes over, and capillaries in gill filaments take the dissolved oxygen out of the water and--uh--the water carries away the carbon dioxide which the capillaries have brought into the filament.

T: Now, you said that the capillaries take the oxygen out of the water. You want to change that a little bit?

S: Yeah--the gas is exchanged by osmosis. The oxygen passes in through the walls of the capillaries.

T: Where do we get the oxygen?

S: Dissolved in water. The air dissolved in water.

T: The air dissolved in water. Not from the water--H_2O. All right, remember that. O.K. Anything else to add?

S: I don't believe so.

T: I think you've covered it pretty well--the mouth--gills--gill rakers--gill filaments and the capillaries which are contained in these.

To constitute an analysis move, there must be some reference to all of the significant parts that make up the referent. A discussion of some of the parts would be described as one or more characteristic moves. It should also be noted that this kind of move does not include the listing of instances or sub-classes of the referent. As can be seen from the two examples given above, the referent is analyzed into a set of parts, all of which would be needed to make up a single instance.

7. Analogy move. In this kind of move, the referent is likened to something else, and possibly, the ways in which it is like something else are discussed. These moves may include precise analogies in which an exact parallel of characteristics is established, or they may include a relatively vague analogy by which general similarity is suggested. The following example is taken from a discussion of "cerebellum" in a physiology class.

Example 11

T: Now, what is the shape--what is the shape of the cerebellum? If you saw it from, say, the back, what would it appear to be like?

S: Well, sort of like the wings on the side of a moth--or a--

T: Yes, go ahead.

S: That's all.

T: It would appear to be sort of like--uh--the wings of a moth or butterfly.

Here the shape of the cerebellum is said to be like the shape of the wings of a moth or butterfly. The analogy is specific, and limited to a single characteristic. In the next example, the analogy is more complex. The topic of the discussion is the "nervous system."

Example 12

T: What would it [the nervous system] correspond to in a building?

S: A telephone system of wiring--set up of electrical wiring?

T: Yes, more of an electrical set-up. That is, it would be subject to carry, communicate or transport. It would correspond to your--carrying something--messages from place to place and--something tells you something and the answer being given, and then there is the answer brought back and being carried out.

While this analogy is somewhat vague, it is suggestive of a complex set of similarities between the nervous system and an "electrical set-up" in a building. Like other moves of this kind it relies heavily on what the student knows about the thing which the concept is likened to, and is likely to be interpreted in quite different ways by different students. Some students may know little or nothing about what is referred to, in the example above, as the "electrical set-up" of a building, so that the analogy provides them with a minimum of information about the central nervous system. Others may know more, but not know in what respect the analogy holds.

8. Differentiation moves. Three different kinds of differentiation moves have been distinguished. In the first kind (referred to as an "opposition" move) something is mentioned or discussed as the opposite of the referent. This kind of move occurs infrequently since it is only occasionally possible to speak of the opposite of a concept. A rather confused example of this kind of move is given below. It is from a discussion of "rationalization."

Example 13

T: Could a rational person be a straight thinker?

S: Well, in the movie it said it was the--uh--
opposite of a scientific thinker.

T: Yes. Rational thinking [sic] is believing just
what you want to believe or thinking just what you
want to think regardless of what the situation
might be. As you said, it's the opposite of
scientific thinking.

If, in this exchange, the teacher is credited with having accidentally used the word "rational" when he intended to use the term "rationalization," then the point is made that "rationalization" is the opposite of scientific thinking.

In the second kind of differentiation move, it is stated that the referent is not the same thing as something else, or that it is not like something else, without any discussion of the nature of the difference. This kind of move is an abbreviated form of the third kind of differentiation move. In the third kind of differentiation move there is some discussion of the nature of the differences between the referent and something else. This third type of differentiation move is illustrated below in a section from a discussion of "parole."

Example 14

T: What's the difference between probation and parole"

S: Well--parole, you're free, you don't have to report
to your probation officer.

T: Are you sure?

S: No.

T: Elizabeth?

S: Parole--you have to serve part of a prison sentence. Probation--you don't, but you still have to report practically every week.

T: Do you agree with that?

S: In this parole--you still have to get out on good behavior or something. You have to get in there first, then you get out.

T: Parole refers to your good behavior in prison and your release to some probation officer--then that way he is, of course, free as long as he is doing what he is supposed to. As long as he does not violate the terms of his parole.

The effect of the differentiation move given above is to point out some of the characteristics of "parole." This appears to be one of the common functions of differentiation moves. Another function which they may have is to indicate that some of the characteristics of the concept should not be taken as criterial attributes since they are in fact characteristics shared with some other concept.

As with analogy moves, differentiation moves appear to rely on the knowledge which the student already possesses about the thing which the concept is being related to. For instance, in the example given above, to know that rationalization is the opposite of scientific thinking is not very informative unless the student knows something about scientific thinking. Differentiation moves may only be effective when students are likely to confuse two relatively well-known concepts.

9. Instance comparison moves. This kind of move is the same as the analogy and differentiation moves described above, except that the comparison is made between instances or sub-classes of the referent itself. The following example is taken from a discussion of "acids" in a chemistry class. Properties of acids and the way in which they ionize have been discussed with reference to the standard examples of acids,

Example 15

T: (Continuing) And the amount of H+ that you have determines the strength of the reaction. Which means that some of these [acids] may not ionize as rapidly as some of the rest of them. You may have the same quantity of acid in there, but the acid doesn't break up, or ionize, as rapidly as some other acid. Now for example, some of these will ionize very rapidly, and have a great number of [inaudible] in there.

In this example, the teacher is not specific about which instances of acids he is referring to, but indicates only that instances will vary in this particular way.

In general, the function of instance comparison moves appears to be to develop or extend the information about some characteristic of the referent. Occasionally, significant differences which provide means of identifying different sub-classes are discussed. This occurs in the following example taken from a discussion of "amphibia" in a biology class.

Example 16

T: Where else do we have a big difference in these animals? How many others noticed a big difference?

S: Would it be that--uh--salamanders have gills?

T: The salamanders--see the picture of one there? [Refers to picture in textbook.] The salamanders still have their gills on. But the frogs lost their gills from the tadpole stage into the adult stage.

It would seem, on theoretical grounds, that this kind of move ought to occur prominently in situations in which the characteristics of the referent are being inferred from observations of instances. However, there were no clear cases of this kind of "discovery learning" in the recorded discourse obtained for this study.

10. Positive Instance move. In this type of move a particular instance or sub-class of the referent is pointed out, named, or described. But there is no discussion of why the thing which is identified should be considered as instance or sub-class. The following example is taken from a discussion of "toads." The teacher mentions a type of toad, and asks that it be described.

Example 17

T: What's interesting about the spadefoot toad? Did you ever hear of the spadefoot toad? What can you tell us about him? What do they have?

S: Well, they have a spur on the back of each--I think it's all four feet, and they can dig backwards in the ground.

T: All right. They can dig backwards.

In the next example, a positive instance is merely mentioned during the course of the lengthy description of the meaning of "satire" given by the teacher.

Example 18

T: (Continuing) The next book that we're going to read, Babbitt by Sinclair Lewis, is one of the finest examples of a novel that is satire.

In some situations, the students may be actively involved in identifying positive instances. The next example is taken from another English class. The concept which is being discussed is "metaphor." This move is one of a series of closely similar moves.

Example 19

T: Find another one? Still on page 119. Can't you find one?

S: No.

T: Yes?

S: "She was the apple of his eye, the idol of his heart."

T: "She was the apple of his eye" would be which figure of speech?

S: Metaphor.

T: Yes.

Positive instance moves may serve any of a number of functions. In some situations they appear to be part of an exercise in the use of the class term. In other situations they may be used to illustrate, or exemplify, characteristics of the referent, although specifically which characteristics are relevant criteria is not discussed. Descriptions of positive instances appear to be a necessary part of the discussion when it is impossible, or difficult to expose the student to actual instances, or to assume that the student has had some experience with instances. It may be for this reason that positive instance moves are more common in English and social studies classes than they are in classes in science subjects.

11. Instance Enumeration move. In this kind of move, the referent is treated as a class, and the full set of instances or sub-classes which make up that class is listed or described. Obviously, this kind of move is only possible when it is possible to subdivide the class into a limited set of sub-classes. Thus, this kind of move is found most often in subject areas where a formal taxonomy is established such as biology and chemistry. The following example is an abbreviated section of discussion from a chemistry class. The members of the "alkali family" are listed and described.

Example 20

T: Eleanor?

S: The--alk--alkali family?

T: That's right.

S: The first member of the alkali family is lithium. It is the least dense of all metals and is not very common. . . . The next is sodium. It is common and is used in compounds . . . Potassium is the next metal of the alkali family. Potassium is used for . . . Rubidium and Cesium are two--are two other metals in the alkali family. We know very little about them. And Francium is a radioactive element, and its metal is also.

Here the concept is a defined class of elements, and it is described by listing and describing the full set of elements which it contains. The next example is taken from a class in sociology. It was part of a discussion of "crime."

Example 21

T: And they [crimes] are classified in what way?

S: Well, the first one would be treason. Treason, and there's felony--and misdemeanors.

T: What's the meaning of treason?

S: There are two subdivisions--like--uh--sabotage or something like that.

T: That will be some attack against the nation. That might also be betrayal of the nation by giving away information. What's the definition of felony?

S: It's an act that's generally punishable by death or sent to state prison for not less than, or at least more than one year.

T: And a misdemeanor?

S: That's a less crime--usually not for more than a year.

Apparently this kind of move is most often used when the teacher is working through a well-structured sequence of topics. For instance, a biology teacher might begin a lesson with a discussion of a general category such as "amphibia." The sub-classes of this category might be listed, briefly described, and compared with each other (instance enumeration and instance comparison moves). Then the teacher might proceed to each of the sub-classes in turn and treat these as the major topics in a sequence of further concept ventures. In this situation, the instance enumeration and instance comparison moves serve to introduce later topics and indicate the structure within which they are related.

12. Negative instance move. In this kind of move, something is mentioned or described, and it is stated that it is not an instance or sub-class of the referent. Usually, the thing which is identified is similar to an instance or sub-class so that there is a likelihood of it being incorrectly classified. In the following example, "swallowing" is suggested as an instance of the class of "voluntary acts."

Example 22

T: A voluntary act. Now--uh--what is a voluntary act?

S: Like swallowing.

T: It's what?

S: Swallowing or breathing?

T: Would swallowing be a voluntary act?

S: No.

T: No, I don't believe it would.

Example 23

T: Who can name me another animal--see whether you've heard of this animal--which has a warty skin, but he's not an amphibian, he's really a lizard. How many have ever heard of one called a toad and didn't know--you thought he even belonged to the toads--but he isn't? Can you think of one there?

S: The horned toad.

T: The horned toad. Look on page 377 in your book. There you see, "The horned toad is actually a true lizard."

In the case the function of the negative instance move appears to have been to indicate to students that there is a lizard which is called a toad and which might be incorrectly classed as a toad. The teacher also suggests, by referring to the "warty skin," why this lizard has been called a toad.

13. Instance production move. In this kind of move there is discussion of the way in which an instance may develop, or may be produced. It is the kind of move which is applicable when the concept is an outcome, or product of some known activity or procedure. The most efficient way of describing such a concept may be to describe how an instance is produced, or how it comes about. The following example is taken from a discussion of "acquired reflex." The teacher describes, with elaboration, the process of "acquiring" such a reflex, in this case--riding a bicycle.

Example 24

T: [Continuing] The first time you tried to ride a bicycle you had to keep the thing upright; you had to guide it; you had to keep it going; and you had to watch where you were going; and, as a result, it was just too much to do all at once. The harder you might try the first few times, you probably got a lot of falls and until you got

> where you could make it run downhill and it would keep going on its own momentum, then you could watch the guiding and something else. . . So as you mastered a step at a time each time you rode it, it was a little easier the next time. Maybe after a thousand times you became quite proficient on a bicycle. You can ride the bicycle and then try something else. You don't have to think about that and you can talk to somebody or be watching something, and you don't have to try to watch everything at once which would keep the bicycle moving.

What the teacher appears to be suggesting here is that the acquired reflex of riding a bicycle is the product of repeated practice with the different components of the skill.

The function of this kind of move may be to suggest a set of sufficient conditions in the sense that, if the activity or operation described is performed, an instance of the referent will be produced.

14. Instance substantiation move. In this kind of move something is named or described, and the reasons for concluding that it is an instance, or that it is not an instance, are discussed. Usually, this involves relating the characteristics of the suggested instance to the criterial attributes associated with the concept. An abbreviated section of discourse from a discussion of "romantic poetry" is given below. Contained in this section are three instance substantiation moves which,have been marked off with broken lines. In each of these three instance substantiation moves the suggested instance is a poem which the class has read.

Example 25

T: Now, some of you said the poem was romantic, and if you say so, why would you say so? Why would you say so? . . .

S: I said it was romantic because I think the--uh--poet [inaudible] the better man, and a romantic poem does that.

T: All right. That's one of them--point in favor of--of it being a romantic poem.

- -

S: Well, the romantics realized how--that life was what it was, and they didn't try to shield it, and this definitely is the way it is.

T: All right. A characteristic of romantic poems is that they show man not necessarily in harmony with society, but in harmony with nature, and therefore, in conflict with society. This then is the way that--romantics see the individual, very often, and in this sense the poem is romantic, wouldn't you say?

- -

In what sense is it not romantic? . . . Well, did it discuss nature?

S: Well, it used man as a natural thing.

T: How do you know?

S: Well, it talked about hunchbacks and crooked children.

T: Well, does it discuss nature, and man learning from nature? This is romantic, isn't it?

S: That's right . . .

T: Well, there's nothing of that nature discussed in there, is there? . . . So, in this sense it isn't romantic.

In the first instance substantiation move, the poem is said to be romantic because of some reference to the "better man." In the second instance substantiation move, the poem is said to be romantic because it shows man in conflict with society. In the third move, it is asserted that it is not a romantic poem because there is no discussion of "nature and man learning from nature."

These examples of instance substantiation moves have been quoted at length because they illustrate an unusual situation in which characteristics of a concept ("romantic poetry") are being introduced through discussion of something which is both an instance, and not an instance of the concept. This is possible because the concept is a highly abstract one which might be better described as a set of qualities, rather than a class of things. With this kind of concept, there may never be a thing which could be unequivocally classed as an instance, yet the nature of the concept can be fruitfully developed through instance substantiation moves such as those illustrated above. Other examples of this kind of concept might be things like "just act," "democratic institution," "equal opportunity," and so on.

15. Meta distinction move. Moves of this type are in the metalanguage rather than the object language. There were only two moves of this type in our sample, indicating that teachers seldom resort to the level of meta distinctions in classroom discourse. The following is an example of this sort of move:

Example 26

> T: Now the broad meaning of "metaphor," to get back to that, is any kind of figurative language. In one sense, "metaphor" means a particular kind of a figure of speech but in a broader sense it applies to any figure of speech that compares something to something else that it is not but with which it has certain similarities.

It is clear that this move consists of a discussion of an aspect of language. It is this fact that distinguishes the meta move from others in concept ventures.

Patterns of Moves

Having identified the different kinds of moves which occurred in concept ventures, the next problem was to find out how these moves occurred in relation to each other. The important questions appeared to be: (1) In what contexts do the different kinds of moves occur? (2) How is the occurrence of one kind of move related to the occurrence of other kinds of moves? (3) Are there characteristic patterns or sequences of moves which are related to different subject-areas, or different teachers?

1. Types of ventures. As a first step, it was decided to classify ventures according to the kinds of moves which they contained. If it was true that different kinds of moves were associated with different subject-areas, then the frequency of the different kinds of ventures should vary with the subject-area.

Using the major categories of moves (i.e., descriptive, comparative and instantial), seven major types of ventures could be distinguished. These were:

Type I.	Ventures containing only descriptive moves.
Type II.	Ventures containing only comparative moves.
Type III.	Ventures containing only instantial moves.
Type IV.	Ventures containing descriptive and comparative moves.
Type V.	Ventures containing descriptive and instantial moves.
Type VI.	Ventures containing comparative and instantial moves.
Type VII.	Ventures containing at least one of each of the three different kinds of moves.

The frequency with which these seven types of ventures occurred in the recorded discourse is set out by subject-area in Table 5.

Table 5

Frequency of Ventures by Types and Subjects

Subject-area	Number of Teachers	Number of Lessons	Type of Venture							Total
			I	II	III	IV	V	VI	VII	
Biology and Physiology	2	10	31	3		24	17	5	13	93
Physics and Chemistry	2	10	20		6	3	26	2	6	63
Geometry	1	5	3			4	2		1	10
History and Sociology	6	29	7	1	3	3	6	3	2	25
English	3	15	2		8		5	1	3	19
Total			63	4	17	34	56	11	25	210

The first point to be noted in this table is that the frequency of occurrence of concept ventures is quite different in the different subject-areas. Concept ventures occur about seven times as frequently in the lessons recorded in science classes as they do in the lessons recorded in social studies and English. It is also apparent that the distribution of the different types of ventures is related to the subject-area. In general, ventures containing descriptive moves only (Type I), and ventures containing descriptive and instantial moves (Type V) are the most common. Ventures containing only comparative moves (Type II) occur very infrequently. Most of the ventures which do contain comparative moves (especially Type II and Type IV) occurred in the biology and physiology classes. Almost all of the ventures recorded in the English classes contained instantial moves, which was not the case with the other subject-areas.

It cannot be inferred that this distribution of types of ventures would recur in some other sample of recorded lessons, but examination of the content of the ventures identified in this sample suggests that the type of venture is related to content differences. For instance, in the biology and physiology classes the content was treated as highly structured. In the physiology class, the discussion was concerned mainly with systems and the relationship between systems. In the biology class, the discussion was concerned mainly with specific species and sub-groups of animals. It is not surprising, therefore, that the frequency of concept ventures in these classes was relatively high, and that a high proportion of these contained comparative moves. On the other hand, the discussion in many of the English classes was concerned with literature and a number of other relatively unstructured topics, in which there are few useful and precise concepts. Hence, there were very few concept ventures, of which almost none contained comparative moves, and a relatively high proportion contained instantial moves.

2. The patterning of moves. The number of different kinds of moves which were identified in the concept ventures is indicative of the variety and complexity of the discussion in these ventures. The initial impression of considerable variability suggests that teachers are not following any set pattern or sequence in their instruction. However, it

was considered possible that there might be some identifiable regularity to the sequencing of moves, if an appropriate procedure could be found for identifying it.

Two procedures proved useful in the search for patterns. One involved tabulating the consecutive pairs of plays which occurred, and the other involved plotting the sequence of consecutive plays in a type of flow diagram. It will be remembered from the previous chapter that a play consists of a move of a single kind, or a consecutive sequence (or repetition) of the same single kind of move.

After identifying all of the plays which occurred in each of the recorded concept ventures, the frequency of each of the 210 possible consecutive pairs of plays was tabulated. The results of this tabulation are set out in Table 6.

Table 6. Frequency of Pairs of Plays in Concept Ventures

First Play in Pair	Second Play in Pair: 1. Character.	2. Suff. condn.	3. Classifn.	4. Class.descpn.	5. Rel. charact.	6. Analysis	7. Analogy	8. Differentn.	9. Inst. comp.	10. Pos. Inst.	11. Inst. enum.	12. Neg. Inst.	13. Inst. prodn.	14. Inst. substn.	15. Meta distn.	End of venture	Total number of plays
1. Characteristics		5	14	8	1	4	11	32	4	36	3	4	9	8	2	91	232
2. Sufficient conditions	1						1	2		3	1					6	14
3. Classification	15						3			2		1				5	26
4. Classif. description	19		1					2	1	7			2		1	5	38
5. Relation character.	2	1														1	4
6. Analysis	5						1	1					1			6	14
7. Analogy	12		2	1		1		3		1		1				7	28
8. Differentiation	19		1	2			1		1	10		1		6		23	64
9. Instance comparison	3						1			5			1	1		3	14
10. Positive instance	29	2	2	5	2	1	5	7	5		2	6	5	11		29	111
11. Instance enumeration	2									4			1			8	15
12. Negative instance	4					1		1		5						3	14
13. Instance production	9								1	5						6	21
14. Instance substantiation	5	1				1		1	1	7					1	15	32
15. Meta distinction	1									1				1		2	5
Total	126	9	20	16	3	8	23	49	13	86	6	13	19	27	4	210	632

Reading across the rows, this table indicates that plays consisting of "characteristic" moves were followed by plays consisting of "sufficient condition" moves five times, by plays consisting of "classification" moves fourteen times, by plays consisting of "classificatory description" moves eight times, and so on. The number in the column headed "End of venture" indicates the number of times a particular kind of play occurred at the end of a venture and consequently was not followed by any other play. This table can also be read by columns which indicate that, for instance, "characteristic move" plays were preceded by "sufficient condition move" plays once, were preceded by "classification move" plays fifteen times, and so on.

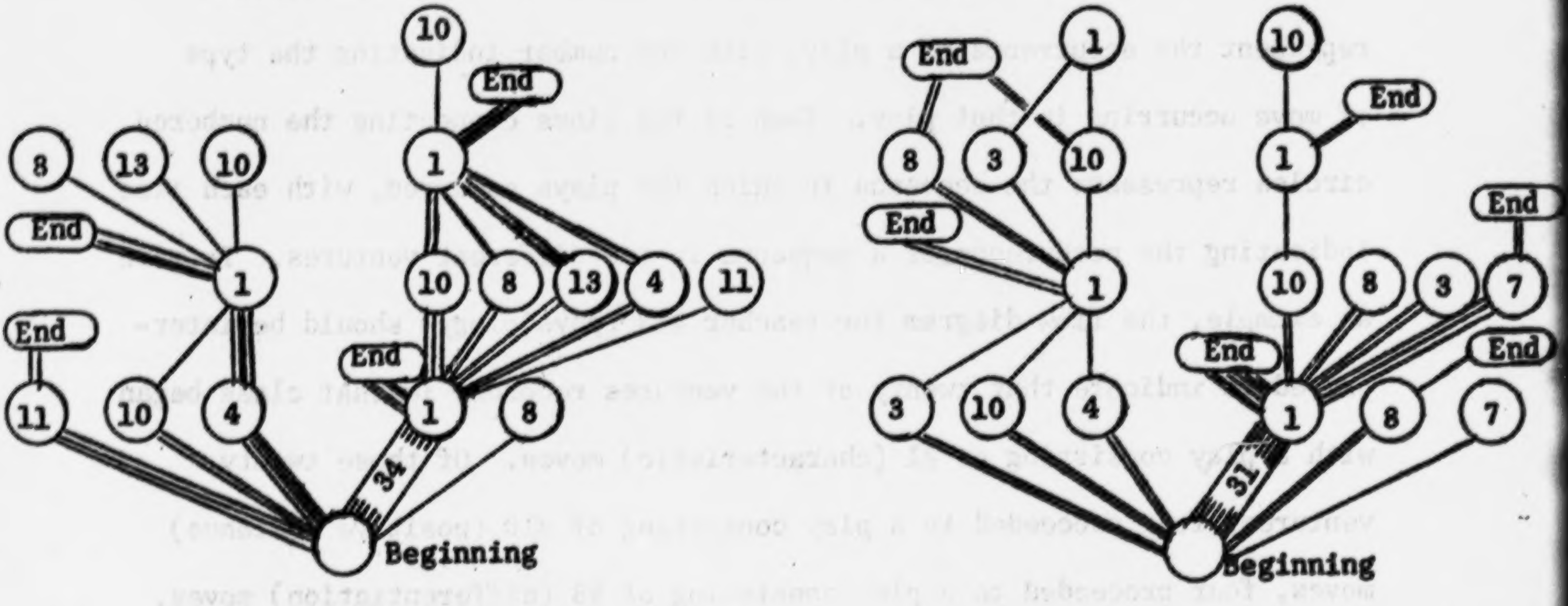
It is apparent from an examination of Table 6 that, of all the possible pair combinations of moves, only 91, or 43%, of these occurred at all. Also, of those pairs of plays which did occur, seven-eighths (87.4%) included either a play consisting of "characteristic" moves, or a play consisting of "positive instance" moves, or both. Thus, it would seem that when the sequencing of moves by pairs is considered, there is relatively little variability. The discussion appears to keep close to either of two kinds of moves--the characteristic move, or the positive instance move. Or, to state it another way, characteristic and positive instance moves are evenly distributed throughout the sequence of moves in each of the ventures.

In order to examine the patterning of plays in concept ventures in more detail, composite flow diagrams representing these patterns were constructed for different groups of ventures. Of particular interest were the composite flow diagrams constructed to represent the sequencing

Figure 1. Flow Diagrams of Play Sequences for Three Science Teachers

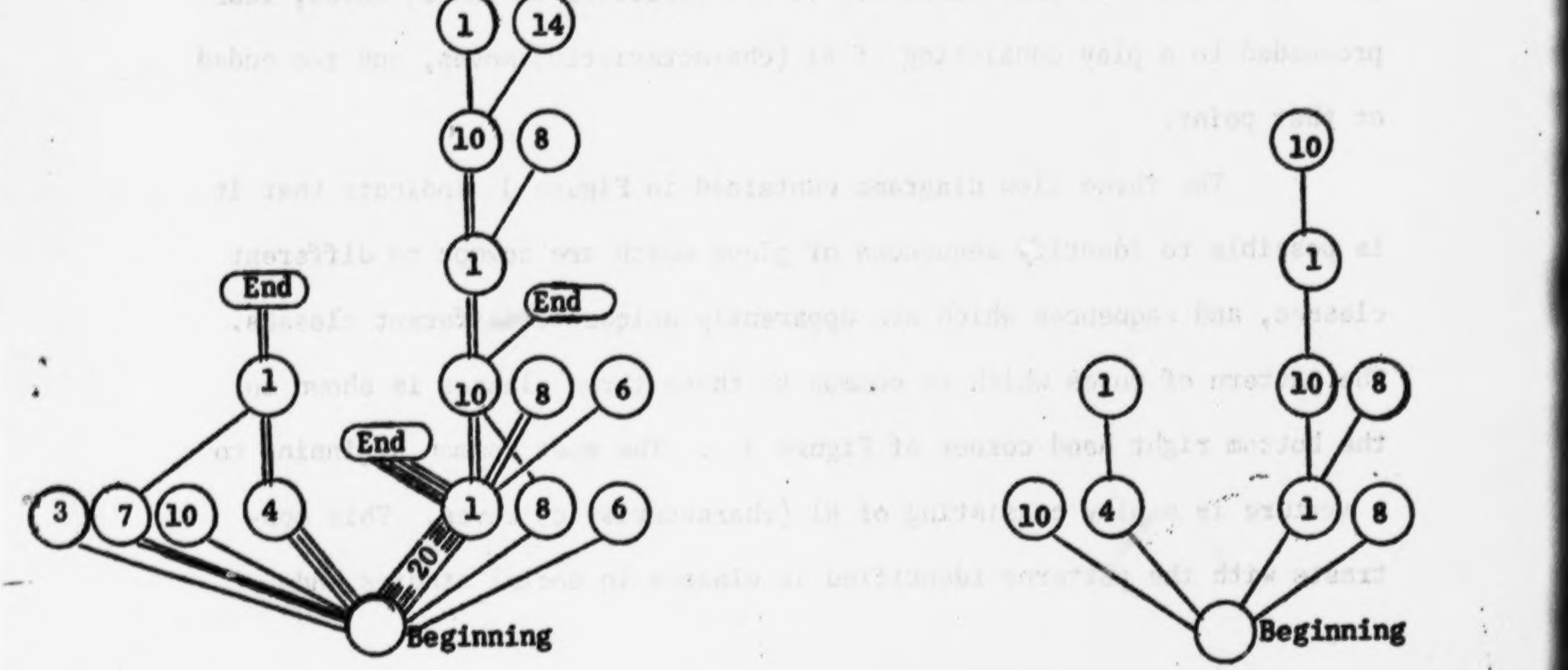
(1) Teacher #41, Chemistry
(54 ventures from five lessons)

(2) Teacher #22, Biology
(54 ventures from five lessons)


10
End
8
13
10
1
End
1
10
8
13
4
11
End
End
11
10
4
1
8
34
Beginning
End
1
10
End
8
3
10
End
1
End
10
8
3
7
1
End
End
3
10
4
1
8
7
31
Beginning

(3) Teacher #33, Physiology
(39 ventures from five lessons)

(4) Common Play Sequences for the Three Teachers


1
14
10
8
1
End
End
1
10
8
6
End
3
7
10
4
1
8
6
20
Beginning
10
1
1
10
8
10
4
1
8
Beginning

of plays occurring in the concept ventures recorded for each teacher. The flow diagrams representing the ventures from three classes in science subjects are included in Figure 1 . In order to simplify these diagrams, only those sequences of plays which recurred in the same position in at least two different ventures have been included. The numbered circles represent the occurrence of a play, with the number indicating the type of move occurring in that play. Each of the lines connecting the numbered circles represents the sequence in which the plays occurred, with each line indicating the occurrence of a sequence in two different ventures. To give an example, the flow diagram for teacher #33 (physiology) should be interpreted to indicate that twenty of the ventures recorded in that class began with a play consisting of #1 (characteristic) moves. Of those twenty ventures, four proceeded to a play consisting of #10 (positive instance) moves, four proceeded to a play consisting of #8 (differentiation) moves, two proceeded to a play consisting of #6 (analysis) moves, and ten ended after the occurrence of the #1 (characteristic move) play. Of the ventures in which the second play consisted of #10 (positive instance) moves, four proceeded to a play consisting of #1 (characteristic) moves, and two ended at that point.

The three flow diagrams contained in Figure 1 indicate that it is possible to identify sequences of plays which are common to different classes, and sequences which are apparently unique to different classes. The pattern of moves which is common to these three classes is shown in the bottom right hand corner of Figure 1 . The most common beginning to a venture is a play consisting of #1 (characteristic) moves. This contrasts with the patterns identified in classes in social studies and

English in which ventures beginning with #10 (positive instance move) plays were as common as ventures beginning with #1 (characteristic move) plays. With the science classes depicted in Figure 1 , the sequence of #1 - #10 - #1 - #10 occurs in each of the classes, and is the longest common sequence. For the flow diagrams constructed from the social studies and English classes, there was no similar longer sequence, possibly due to the small number of concept ventures recorded in these classes.

Unique patterns are also evident from these flow diagrams. For instance, in the flow diagram for the class in biology, the play consisting of #3 (classification) moves occurs in several places as a significant part of the pattern. The same play occurs only once in the diagram for the physiology class, and not at all in the diagram for the chemistry class. Instance enumeration (#11) and instance production (#13) plays figure prominently in the flow diagram for the class in chemistry, but do not appear in the diagrams for the other two classes. The flow diagram for the class in physiology contains two plays consisting of #6 (analysis) moves, which do not appear in the diagrams for the other two classes. It would seem, intuitively, that the occurrence of these unique patterns is related to the nature of the subject matter being discussed. To what extent it is also related to the individual teachers' styles of dealing with the subject matter cannot be ascertained from these data.

One general characteristic of all concept ventures became apparent from an examination of the flow diagrams which were constructed for each of the classes. This was the tendency for the discussion to keep returning to a play consisting of #1 (characteristic) moves. This pattern is evident quite clearly in the flow diagrams for the classes in chemistry and biology depicted in Figure 1. It is as though the discussion was conforming to the rule: when you start with a #1 (characteristic move) play, you can proceed to another kind of play, but must then return to a #1 (characteristic move) play again, or, when you start with some other kind of play, you must proceed to a #1 (characteristic move) play, before proceeding on to another kind of move again.

Perhaps the most obvious conclusion which can be derived from the analysis of patterns of moves in concept ventures is that not only is the direct description of a characteristic the most common kind of move, but even when other kinds of moves occur, there is a constant returning of the discussion back to this kind of move. It is interesting to note that this pattern has some similarities with the alternation of exposure to examples and discussions of "generalizations" advocated by a number of writers on the basis of experimental investigations of "discovery learning" procedures. For example, Krumboltz and Yabroff (1965) conducted an experimental investigation of deductive and inductive sequences in programmed instruction in which alternation of rules and examples was compared with longer non-alternating sequences. They found no significant differences on a criterion test, but concluded that: "On a priori grounds, it still seems reasonable to believe that frequent shifts from rules to examples and back again would lead to a better understanding of the material."

However, what is observed in discussions in concept ventures is more complex than a simple alternation of "rules" (so far as characteristics can be called "rules") and examples. It is an alternation between "rules" and a variety of other kinds of discussion of which description of instances is only a part.

The Effects of Different Patterns of Moves

The analysis of the discussion occurring in concept ventures raised a number of questions about the relationship of different types of moves and different patterns of moves to student learning. Does it make any difference if the discussion includes some types of moves rather than others, or if the pattern or sequence of moves is changed? And if types of moves or patterns of moves do have an effect on student learning, how can this be accounted for?

Examination of the results of reported investigations of methods of teaching concepts provides little if any guidance. There have been a number of studies in which deductive and inductive sequences have been compared. The results of some support an inductive sequence (cf. Kersh, 1958; Ray, 1961), and the results of others support a deductive sequence (cf. Craig, 1953, 1956). Still others found the two methods equally effective (Forgus and Schwartz, 1957; Krumboltz and Yabroff, 1965). As Krumboltz and Yabroff indicate in the report of the study described above, the difficulty in drawing conclusions from these studies stems from the failure to define precisely what is meant by "inductive" and "deductive" sequences, and consequently from the failure to control a number of other variables, such as quantity and type of information contained in the instruction, which may have affected the results. A further difficulty stems from the assumption, apparently based on the confusion of psychological studies of categorizing responses with concept learning in a school setting, that the "deductive" and "inductive" sequences are the only important methods of teaching concepts. Little if any account has been taken of the variety of other procedures which this analysis of discussions in concept venture indicates are frequently used by teachers.

Thus, we are left with little relevant information about what to expect when kinds of moves or patterns of moves are varied, apart from the suggestion, based on the investigations of Johnson and Stratton (1966) and Newton and Hickey (1965), that the significant aspects of different methods of teaching concepts have yet to be discovered.

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Chapter VII

ANALYSIS OF CAUSAL VENTURES

A causal venture is one which has as its objective the exploration of a cause-effect relationship. History classes discuss such things as the factors that produced the industrial revolution. Social studies classes discuss the means of eliminating poverty. Chemistry classes discuss the results of putting sodium in water. When they do so, their discussions constitute causal ventures.

Nature of Causal Ventures

A causal venture may be either of two basic types, which for the sake of convenience are called type A and type B. It may be concerned with discovering the cause or causes of some specified condition or class of conditions* (type A). Alternatively, a causal venture may attempt to disclose the effect or effects of a given condition or class of conditions (type B).

Causal ventures of type A are often initiated by a question such as 'What caused X?,' 'What are the conditions which produce X?,' or 'Why did X occur?' The remainder of the venture attempts to arrive at an answer to the question and to support the answer with evidence or argument. In some cases, type A ventures are launched by a declaration of the form 'Condition A(or Conditions A, B, C) causes condition X.' The remainder of the venture gives evidence or argumentation to support or refute the declaration. Note that cause-effect relationships in type A often have more than one cause, but seldom more than one effect.

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* 'Condition' is used in a very broad sense to include event, action, state of affairs or a characteristic of one of these.

Type B ventures most often begin with a question of the form 'What were the effects of condition A?,' or 'What resulted from condition A?'. The succeeding discussion attempts to give and to substantiate an answer to these questions. This type of venture may also begin with a declaration. In this case the declaration is of the form 'Condition A produced condition X (or conditions X, Y, Z).' The ensuing discussion tries to substantiate or to refute the declaration.

There need be no explicit use of either the term 'cause' or the term 'effect' in a causal venture. A number of terms somewhat synonymous with 'cause' may be used. These include: 'is responsible for,' 'favors development of,' 'leads to,' 'produces,' 'results in,' 'contributes to,' 'determines,' and 'fosters,' as well as many others. In many cases no synonym for 'cause' or 'effect' is used. Instead, the discussion is concerned with answering a "why" question.

There are no easy verbal cues for identifying causal ventures. Consequently, it is important to be clear about the nature of a cause-effect relationship. The most important thing to note is that a cause-effect relationship is, in one important sense, empirical. The statement of such a relationship is not a report of sensory experience, but it is an inference from such experience. The truth or falsity of a statement of a cause-effect relationship is determined by empirical evidence, i.e., evidence based on sense experience. For example, the statement that burning hydrogen in air produces water is a cause-effect relationship. It is an inference based on our observations of the results of cases in which hydrogen has been burned in air. In contrast, the statement 'Using a double negative results in making an ungrammatical statement' does not state a cause-effect relationship.

The truth or falsity of the statement is dependent not on empirical tests, but on the rules of English grammar.

Cause-effect relationships may be of several different kinds. In the strongest type of relationship, x is said to be a cause of y only if x is both necessary and sufficient to produce y. It is usually this kind of relationship we are seeking when we look for the cause of a disease. One gets polio if and only if he is infected with the polio virus. When speaking of this type of relationship we talk about the cause of the disease rather than a cause of the disease.

A second type of causal relationship is that in which x is said to be the cause of y when x is a condition necessary to the occurrence of y. This type of relationship is expressed in the statement 'Children wouldn't be delinquent if we didn't coddle them.' In other words, coddling of juveniles is a necessary condition for producing juvenile delinquency.

In the third type of causal relationship 'x causes y' means the same as 'the occurrence of x is sufficient to produce the occurrence of y.' The statement: 'Whenever you burn hydrogen in air, water is produced,' states such a relationship. The cause (burning hydrogen in air) is sufficient to bring about the effect (water). While the causal condition in this case is sufficient to produce water, it is not a necessary condition. Water may be produced in many other ways.

A fourth type of cause-effect relationship is that in which the cause is a condition which contributes to the production of the effect or makes its occurrence more likely. The cause in this case is neither sufficient by itself to produce the effect, nor is it necessary. The cause in conjunction with other conditions, usually unspecified and unspecifiable, is sufficient to produce the effect. Thus its occurrence makes the occurrence of the effect more likely. When we say 'Competition for colonies helped to produce World War I,' we are stating a cause-effect relationship of this type. The war might have occurred without the competition, but it seems less likely that it would have done so. The cause in this case is a contributing condition, but neither a necessary nor a sufficient condition.

It is fairly easy to distinguish causal ventures from most of the other kinds of ventures. However, cause-effect relationships bear a strong resemblance to the objectives of rule, procedure, and reason ventures. Distinguishing cause-effect relationships from these other objectives should help to avoid confusion.

Both rules and cause-effect relationships of the means-ends variety are used to guide action. What distinguishes the two is the fact that rules are analytic or conventional relationships, whereas cause-effect relationships are as already noted, empirical. An analytic relationship is a relationship between concepts not between things in the world. It holds by virtue of the meanings of the concepts involved. No sensory experience can support it or refute it. For example, no sensory experience is relevant to determining the truth of the rule 'The area of a rectangle equals its base times its height.' Conventional relationships are those which hold because people agree that they shall hold. The agreement may be explicit, or it may be built into the cultural heritage. In neither case does the validity of the relationship rest on empirical evidence. For example, rules of language such as 'Adjectives modify nouns' cannot be shown to be true or false by sense experience. In contrast, all cause-effect relationships can be proven true or false by empirical evidence. To determine whether or not establishing a curfew is a means of reducing juvenile delinquency we have to set up a curfew and observe the results.

A procedure, too, is an empirical relationship which is used to guide action. It is a series of steps one follows to attain a given end. Cause-effect relationships of the means-ends variety, on the other hand, never involve a sequence of steps to be performed in achieving the end.

The distinction between causal ventures and reason ventures will be developed at some length in the discussion of reason ventures, but a word of comment is in order here. Reason ventures are concerned with the considerations a person takes into account in deciding to undertake some action. These considerations do not count as causes.

Moves in Causal Ventures

In any discussion of a cause-effect relationship, three basic tasks may be performed: (1) some condition identified as a cause is mentioned and clarified; (2) some condition identified as an effect is mentioned and clarified; and (3) evidence is given to establish or refute the claim that a causal relationship exists between the conditions cited as cause and effect. Each move in a causal venture gives a specific item of information relevant to the performance of one or another of these tasks.

To provide an overview of the kinds of moves found in causal ventures, we will list all the kinds of moves before returning to a detailed discussion of each type. When moves are grouped according to the three functions given above, they fall into the following three classes:

I. Cause Describing

1. Cause identifying
2. Cause explicating
3. Cause evidencing
4. Cause explaining

II. Effect Describing

5. Effect identifying
6. Effect explicating
7. Effect evidencing

III. Relational Moves

8. Causation instancing
9. Generalization
10. Chaining
11. Concomitant variation
12. Refuting alternatives
13. Causation agreement
14. Meta-cause

Moves are determined by the type of information they give relevant to the objective of a venture. A statement could be one kind of move in one causal venture and a different kind of move in another causal venture. In other words, it is the relationship between an item of information and the objective which determines what kind of move the item of information is. This being the case, the best way to understand the various kinds of moves is to view them in context. Two ideal and simplified causal ventures have been fabricated for illustrative purposes and are presented below. They are divided into moves and each move is labeled.

Venture I

(1) effect identifying	S:	Why are the lids of the milk bottles on my porch pushed up some mornings?
(2) effect explicating	T:	Do you mean the milk bottles that are filled with milk and the milk pushes them up?
	S:	Yes.
(3) cause identifying	T:	That's a good question. Can you answer it, John?
	J:	The cold does it.
(4) cause explicating	T:	The cold?
	J:	Yes, the temperature goes down below 32°.
(5) meta-cause	T:	Cause-effect relationships have to be based on facts. Do you have any facts to back up what you say?
(6) cause instancing	J:	Well, I've seen our caps pushed up three times, and every time it was real cold. And other people's caps were pushed up those mornings too.
(7) concomitant variation	J:	And I've seen milk bottles with their caps pushed up when it wasn't real cold out.
(8) chaining	T:	Bill, what do you think?
	B:	I think it must have been the cold. Real cold weather makes the milk freeze. Milk expands when it freezes and the expansion of the milk pushed up the caps.
(9) causation argument (citing authority)	B:	Besides, I asked the milkman and he said it's the freezing temperature that does it.

Venture II

(1) effect identifying	T:	What caused the ice on the sidewalk to melt today?
(2) cause identifying	S:	The temperature got up above 32° today.
(3) generalization	T:	What has that got to do with the ice melting?
	S:	Ice always melts when the temperature is above 32°.
(4) cause evidencing	T:	Are you sure it was that warm today?
	S:	Yes, I looked at the thermometer this morning and it read 35°.

(5) refuting alternatives	S:	Besides the only other thing that could have melted the ice was if somebody put salt on it, and I know there wasn't any salt put on it.
(6) cause explaining	T: S:	Why do you suppose it got so warm today? A warm wind came in from the South.

Let us turn now to a consideration of each move, illustrating each one by reference to ventures taken from classroom discourse.

Cause identifying moves. Identifying a condition as a cause does not always or even usually involve stating that the condition is a cause. Most often the condition is identified as a cause by being mentioned or described in a context which makes it clear that the condition is being considered as a cause. Move 3 in Venture I identifies cold as a cause. The context which makes it clear that cold is regarded as a cause is that 'The cold does it' is given as an answer to the "why" question which initiates the venture and sets its focus. The "why" question in move 1 is a request to supply a cause. Move 3, in fulfilling this request, cites the cold and thereby identifies the cold as a cause. The information given in move 2 Venture II constitutes a cause identifying move because it is an answer to the request for a cause made in move 1.

Consider now two examples of cause identifying moves taken from classroom ventures. Example 1 is from a venture in a history class. The utterances contained in it were offered in response to the question 'Why did Andrew Jackson have personal enemies?'. This question sets the focus for subsequent discussion.

Example 1

S 1: Well, when Jackson wants to do something, he didn't care whose toes he stepped on to get what he wanted done.
S 2: Who did you say? Jackson?
S 1: Yeah.

In this case the "why" question supplies an effect and requests that it be accounted for. By indicating that Jackson's stepping on toes is an answer, the utterances in the example identify Jackson's stepping on toes as a cause.

Example 2

This example is taken from a venture in a chemistry class.

T: I'd like to see what some of you got for an answer. "Calcium hydroxide with nitric acid."

This utterance seems somewhat vague. However, the context of the lesson makes clear that the teacher is asking what is produced when calcium hydroxide reacts with nitric acid. This reaction, then, is a condition the effects of which are explored in the remainder of the venture. This makes it clear that the reaction is being considered as a cause.

Cause explicating moves. A number of different kinds of information about a cause can be given in this move. Basically, it makes clear just what the cause is and what it implies. Move 4 in venture I above gives precision to the causal condition--cold--by specifying cold as temperature below 32°. The importance of a cause explicating move lies in the fact that it points out characteristics of the causal condition which are most significantly related to the production of the effect. Quite often some complex phenomenon is cited as a cause, but only one aspect or characteristic of the phenomenon is correlated with the effect. A cause explicating move generally calls attention to this aspect or characteristic. Thus it prepares the way for the giving of evidence in support of the causal relationship.

Example 3

> This is taken from a causal venture in which water, taken into a fish's mouth and pushed out through its gills, is identified as a cause. The effect is that oxygen is taken from the air in the water into the blood of the fish.
>
> T: How does a fish do this?
> S: The gills have filters.
> T: All right, you're correct on that part. Now what can you tell us about these gills? Let's be a little more definite about it.
> S: Well, in the gills are five gill arches which have gill filaments on them. These filaments are supplied with many capillaries.

In this case the cause is a process (water passing through gills), and the cause explicating move gives information about the process by describing the structure involved in the process (the gills). Note that this information about the process is very important in establishing the relationship between the process and its effect. Oxygen gets from the water into the blood by passing through the walls of the capillaries.

Cause evidencing moves. A move in this category takes either of two forms depending on the cause to which it is relevant. If the move yields evidence for a cause consisting in a particular phenomenon, then it gives evidence or cites authorities to indicate that the phenomenon actually did occur. If, however, it is evidence for a class of things identified as a cause, the move gives an instance of the class. In venture II above, move 3 gives evidence that the particular causal condition (temperature above 32°) did in fact exist. The information given as evidence in this move is that the thermometer registered 35°.

Example 4

> This example comes from a venture in a sociology class. Prior to this move the class has identified mistreatment in prison as the cause of the failure of prisons to rehabilitate criminals.
>
> S: They said in the article that--it's in the Post magazine, October eighth. And it said that in some prisons they still take them and string them up by their thumbs and they put them in these little cells with sides about five feet tall and they put men in there that are six feet tall and six-two, and make them stand in there. And the only ventilation they get is the little pipes sticking up through the roof. They make them stand in there for solitary confinement.

This move cites instances of the cause (mistreatment) as evidence to support the claim that the mistreatment exists. The instances of mistreatment mentioned are hanging prisoners up by their thumbs and cramping them in cells.

The next example occurred in a history venture. In this venture the cause is that Jackson did not care whose toes he stepped on. The effect is Jackson had personal enemies.

Example 5

> S: Well, I thought he (Jackson) was in favor of the people, so he wouldn't want to step on their toes, would he?

This move gives evidence indicating that the condition identified as a cause did not actually exist. By noting that Jackson was in favor of the people, this move gives evidence against the claim that Jackson was not concerned about whose toes he stepped on. A move to show that the suggested cause did not occur is very important. Proving that the causal condition did exist does not prove that the causal relationship holds. However, to prove that the causal condition did not exist is to prove that the stated causal relationship does not hold.

Cause explaining moves. Any attempt to account for the occurrence of a cause constitutes a cause explaining move. Move 6 in Venture II above qualifies as such a move because it tells why the weather was warm--above 32°. The next two examples are representative of the cause explaining moves found in our sample. In the venture from which example 6 is taken, the effect is the government's awareness of the possibility of annexing Hawaii. The cause is the revolution in Hawaii in the early 1890's that was directed against the Queen.

Example 6

T: Why hadn't they liked the Queen?
S: She had attempted to go contrary to the constitution.
T: They had had a constitutional government in the islands since about 1800. One of the ancestors of Queen Liliuokalani had united the islands together and had granted them a constitution. When she came to the throne, she decided that they had too much power for themselves and she didn't like the white people anyway, so she proceeded to overthrow this particular constitution. Whereupon they proceeded to overthrow her.

This move goes to some length to account for the revolution which is identified as the cause in this venture. Moves of this type are most often initiated by teachers. They appear to use it when they want students to be aware of more remote or more basic causes. It forces the students to consider an earlier link in the causal chain.

Effect identifying moves. As with cause identifying moves, effect identifying moves seldom describe a condition as an effect or state that it is an effect. Rather, a condition is identified as an effect by being mentioned in a context which makes clear that the condition is being regarded as an effect. The first move in each of Ventures I and II is an effect identifying move. Move 1 in Venture I mentions the fact of milk bottle lids being pushed up.

It identifies this fact as an effect by asking why it occurs. The "why" question has the force of requesting that causes be given to account for the fact. The first move in Venture II identifies the fact of melted ice as an effect by asking explicitly for the causes which produced it.

Consider now two effect identifying moves taken from class discussions. The first of these is taken from a chemistry class. It occurs as a response to a request to give the results of a chemical reaction between iron and sulfuric acid.

Example 7

S: It gives you $FeSO_4$ plus hydrogen.

The conditions mentioned in this move are identified as effects by the fact that they are named in response to a request for effects.

The next case is an effect identifying move that initiates a venture in an English class.

Example 8

T: After Scobie burned the letter, he speculates. He realizes that he has committed his first crime against the law. Why has he done it?
S: Why has he done what?
T: Why has he broken the law?

The act of breaking the law is here identified as an effect by being mentioned in a context which makes clear that the act is to be accounted for.

Effect explicating moves. Any information about an effect such as its characteristics or how it may be classified constitutes an effect explicating move. This sort of move usually mediates the aspect of the effect most significantly related to the cause. In some cases, however, the move merely clarifies some effect which has been vaguely or ambiguously described. Move 2 in Venture I counts as an effect explicating move because it gives information about the effect; namely, that the milk bottles are full of milk. As the rest of the venture shows, this information is important in relating the effect to the cause.

The next example is from a venture in a chemistry class. Prior to this example the movement of copper ions to the cathode has been identified as an effect of the electrolysis of copper chloride.

Example 9

T: All right. I want to ask you a few questions. You say the copper ion goes to the cathode. How does it become a metal when it gets to the cathode?
S: The ions get onto the plate, and they form a coat on there.

The vague condition 'copper ions go to the cathode,' is clarified by the further information that the ions form a coat of copper on the cathode.

Effect evidencing moves. This move parallels the cause evidencing move. It gives information which serves as evidence that the condition identified as an effect actually does or does not occur. Such a move usually contains no statement that the information is evidence for the effect. Instead, the context in which the information is given makes clear that it serves this function.

Consider the following example taken from a chemistry venture. The fact that house paint turns dark with age is the effect identified in the venture.

Example 10

T: So we do have trouble with this lead turning dark on us, that's for sure. You can see it in your own home at times if you want to.

In this case the occurrence of the effect (paint darkening) is supported by mentioning instances (see paint darkening at your own home).

No moves giving evidence against the existence of the effect were found in our sample. Likely such moves would be found in a larger sample, for they are logically possible and there are no empirical conditions to prohibit their occurrence.

Causation instancing moves. This move relates the cause to the effect. It serves as evidence that the relationship holds. Only ventures in which the cause and effect are classes of things rather than particulars can contain moves of this type. This sort of move includes information that something identified as an instance of the cause occurred in conjunction with something identified as an instance of the effect. Move 6 in Venture I mentions particular phenomena (caps pushed up on milk bottles) identifiable as instances of the effect (caps pushed up on milk bottles in general). These phenomena are mentioned as occurring in conjunction with other particular phenomena (cold mornings) identifiable as instances of the cause (cold).

The first example from classroom discourse gives an instance of the causal relation between parental neglect and juvenile delinquency.

Example 11

> S: She shows this one instance about Bobby Thompson in there. His mother goes out and gives the neighbor kids five dollars a week to play with him. One day he goes to the closet and picks up a twelve-gauge shotgun, double-barrel, shells in both of them. He takes and ties the other kid up, points the gun at his head and fires. This doctor, she accused the parents on the home life. The father and the boy never did get along together. They didn't do anything together. The father hardly had anything to do with him.

The mother's leaving the boy and the father's having nothing to do with him are identifiable as an instance of the cause--parental neglect. The behavior of the father and mother is described as occurring in conjunction with and causing the boy to shoot his playmate. The behavior of the boy is identifiable as an instance of the effect (juvenile delinquency). Note that the information given in this move serves as confirming evidence that a causal relation holds between parental neglect and juvenile delinquency. Of course, a single instance provides only weak support.

Negative instances of causal relationships may also be given. By 'negative instance' is meant a case in which an instance of the cause (effect) occurred, but no instance of the effect (cause) occurred in conjunction with it. A move containing a negative instance is presented in the following example. The cause in this case is slum environment; the effect is delinquency.

Example 12

S: In other words, what about Nathan Leopold? He was brought up in a good environment and he goes out and kills somebody.
T: Brought up a good point.

Leopold's killing somebody is identifiable as an instance of the effect. But by noting that Leopold was brought up in a good environment the student indicates that no instance of the causal condition (slum environment) occurred in conjunction with the instance of the effect.

When a causation instancing move contains a negative instance, it constitutes evidence against the causal relationship. If, as in example 12, there is an instance of the effect but no instance of the cause, then the cause cannot be a necessary condition, although it may still be a sufficient one. If there is a cause instance and no effect instance, the cause cannot be a sufficient condition. Neither kind of negative instance refutes a causal relationship in which the cause is claimed to be only a contributing condition. However, a large number of negative instances in different contexts would probably lead one to conclude that such a presumed causal relation does not hold.

Generalization moves. Information showing that a given causal relationship is an instance of a more general one constitutes a generalization move. Such moves may be used in discussing either particular or general cause-effect relationships. Move 3 in Venture II is a generalization move. It contains the generalization: ice melts when the temperature is above 32°. The causal relation--35° temperature today caused ice on sidewalks to melt--is a particular case covered by the generalization. There is no statement in the move to the effect that the causal relation is an instance or case of the generalization. However, it is clear from the context that the particular case of melted ice falls under the generalization.

Consider an example taken from a venture in a history lesson. In this venture the causal relationship is that the poor conditions in which laborers lived caused the public to be averse to early union organizations.

Example 13

> S: Prejudice is natural against a group who lives in the worst part of town, who are poorly educated and so on.

The general principle is that people tend to be prejudiced against groups who wear poor clothes, etc. Early workers, living in ignorance and poverty, constitute an instance of groups who are poorly clothed, etc. The context in which the generalization is stated indicates that resentment against the early labor unions may be regarded as an instance of prejudice. Thus, the cause-effect relationship is seen as an instance of the generalization.

Very few generalization moves were found in our sample. This is significant since a generalization move, containing a well-founded generalization, supplies the strongest kind of evidence in support of a particular cause-effect relationship. This is so when the causal relation can be deduced from the generalization. We then have as good grounds for believing the stated causal relationship as we have for believing the generalization itself.

Chaining moves. A move of this kind links a cause to an effect by describing intermediate facts which lead to the effect. This may be easier to understand in symbolic form. Suppose the cause-effect relationship were a causes e. A chaining move would indicate that a causes b, b causes c, c causes d, d causes e. There may be any number of links in the chain, but usually there are no more than two or three. Look now at move 8 in Venture I. It links the effect (raised lids) to the cause (cold weather) by noting that cold causes milk to freeze, freezing causes milk to expand, and expansion of milk causes raised lids.

The chaining move presented in the following example links the discovery of gold in Alaska to increased prosperity in the United States.

Example 14

S: The value of the gold means that the prices of corn and wheat go up.
T: All right. The fall in the values there affected prices so the farmers profit.

The fall in the value of gold is noted as a consequence of the cause (gold discovery). This consequence, in turn, is noted as causing an increase in prices of farm products. This increase in price is part of what is meant by prosperity. In this move there is a complete chain, although poorly described.

Chaining moves usually provide evidence for, and clarification of, causal relations by breaking them down into components which, hopefully, are already understood and well established. It is possible, however, for a chaining move to provide evidence against a suggested causal relationship. Such a move notes a consequence of the cause which in turn produces a condition which is contrary to the condition proposed as the effect.

Many of the chaining moves found in our sample are incomplete. Links are left out, probably on the assumption that they are obvious or already well known. Theoretically, chaining moves could include evidence supporting the validity of one or more links in the chain, but no moves of this sort occur in our sample.

Concomitant variation moves. This type of move contains information indicating that changes in the effect occur in conjunction with changes in the cause. Move 7 in Venture I is a move of this type. It notes that when the causal condition (cold) is absent, the effect (raised bottle lids) does not occur.

The example below is one of the few concomitant variation moves in our sample. The causal relation is that contact of lead base house paint with sulfur in the air results in darkening of the paint.

Example 15

> T: Sometimes they put zinc in that paint, too. Instead of darkening, it gets white.

The move notes that the causal condition may be changed from lead base paint to zinc base paint. Given this change the effect (darkening of the paint) does not occur.

Refuting alternatives. In some cases it is possible to support a proposed causal relationship by giving information which rules out the possibility that some other condition might have been the cause. Move 5 in Venture II supports a causal relationship between warm weather and ice melting. It does so by ruling out the possibility that the ice might have been melted by salt.

Moves of this type are most likely to occur in a venture concerned with a causal relationship of the means-ends variety. The example below comes from a venture discussing the proposal that giving prisoners meaningful work contributes to their rehabilitation.

Example 16

> S: They don't want to give something that's--if it doesn't mean anything to them and it's boring. And one thing that was said that they're supposed to be able to do rock formation and ditch digging. Because a lot of people that go in there just might have had real high office jobs or something like that. It would really degrade them to have them dig a ditch. They have to have interesting jobs or else they're just going to try and create trouble.

Briefly, this move indicates that boring jobs such as ditch digging cannot be the means of rehabilitating prisoners. Rather such jobs degrade prisoners and lead them to cause trouble. A move of this sort gives good support to a causal relation when there are only two conditions which are reasonable candidates as causes. To rule out one candidate is to give a clear field to the other. If there are a number of possible causes, ruling out one of them gives little support to any one of those remaining.

Causation argument moves. All of the relational moves discussed thus far provide evidence which is logically relevant to determining the truth or falsity of a causal statement. Causation argument moves are distinguished by the fact that they do not contain logically relevant evidence. Rather they contain other information such as analogies and opinions. The example of causation argument in Venture I, move 9, gives the opinion of a milkman to persuade the group to accept the causal relationship under discussion.

The following example is a move which gives the opinion of an expert. The cause-effect relationship being supported in this case is that making parents pay for their children's misdeeds would cause a reduction in juvenile delinquency.

Example 17

T: And, I believe that Mr. Hoover has on one occasion said that a great deal of our juvenile delinquency was parental delinquency and that possibly making them legally responsible for actions of their children and financially responsible would cause them to be more anxious to see children do what they should.

Mr. Hoover's opinion is cited in this case to support the contention that the causal relation under discussion is valid.

Another sort of causation argument move is given in the example below. In this move an analogy is given to support the contention that the air bladder of a fish causes the fish to float or stay at a given depth.

Example 18

S: It acts something like an inner tube.
T: Something like an inner tube. When you have a little less air in the inner tube, is it more apt that you can float on it, or can't you float easy when you have more air in the inner tube?
S: More air.
T: All right. Wouldn't the fish's bladder be like that?

In this case, the causal relation is supported by drawing an analogy between it and another causal relation (air causes an inner tube to float) known to be valid.

Meta-cause moves. An important thing to remember about this kind of move is that the information in it is relevant to the particular causal relationship only indirectly. A move of this sort may contain information about the nature of a causal relation, information about the kind of evidence needed to support such a relationship, or information about the kind of evidence needed to prove or disprove the particular causal relation under discussion. Move 5 in Venture I is a meta-cause move. It notes a feature of causal relationships in general, namely, that they are based on fact.

The example below contains a meta-cause move from a venture in a biology class. Discussion in this case concerns the contention that handling toads causes warts.

Example 19

T: How can you prove it?
S: Well, the only way I know you can prove it is by keeping a toad for a long time and then if you get a wart, well that would prove it. But then if you didn't----it would be that you didn't get a wart. I don't know.
T: You could handle them and if you didn't get one [wart], then you could say that they [toads] didn't give us any warts.

This move provides information about the kind of evidence needed to prove the particular causal relationship under discussion. Note, however, that it doesn't give any evidence.

Structure in Causal Ventures

Preliminary Considerations. As is the case with moves in evaluation ventures, the moves in causal ventures are both information units and elements in the establishment and validation of a particular relationship. In contrast to the moves in evaluation ventures, the moves in causal ventures exhibit a relatively clear logical relationship to each other. Because of this it is possible to identify relatively distinct types of causal ventures, and types of discussion within these ventures. This means that the procedures used with other kinds of ventures (tabulation of frequencies of pairs of moves, tabulation of frequencies of moves by position in venture) are less appropriate, and probably less meaningful, than the careful categorization of types of ventures and types of discussions among recorded causal ventures.

The most important distinction among causal ventures is between (a) ventures in which an effect is cited near the beginning of the venture and the discussion centers on the cause (or causes) of that effect, and (b) ventures in which a cause is cited near the beginning of the venture and the discussion centers on the effect (or effects) of that cause. These have already been referred to respectively as Type A ventures and Type B ventures.

Within these two major types of ventures there are variations in the number of causes or effects which are discussed. This variation provides three further sub-categories of types of ventures: (a) ventures in which one effect (or cause) is given, and one cause (or effect) is discussed; (b) ventures in which one effect (or cause) is given, and there are several causes (or effects) discussed; and (c) ventures in which there is discussion of several related cause-effect relationships so that several effects (or causes) are given, and several causes (or effects) are discussed.

In addition to this subdivision of types of ventures, it is possible to categorize the type of discussion which occurs with any particular cause (or effect). Regardless of how many causes (or effects) are identified in the discussion in a venture, it is nearly always possible to break up the discussion into sub-units which contain all the discussion associated with a particular cause (or effect). These sub-units consist of a cause (or effect) identification move and the other kinds of moves which relate specifically to the cause (or effect) which has been identified. As can be seen in the analysis set forth below, these sub-units are usually relatively simple (i.e., contain few moves).

Types of Ventures. Table 7 sets out the frequency with which the different types of causal ventures occurred. Separate tabulations for each of the major subject-areas covered by the recordings, are reported. The total number of lessons recorded in each of these subject-areas is also reported to give an indication of the relative frequency of occurrence of causal ventures.

It is evident that causal ventures occur relatively more frequently in lessons recorded in science subjects than in the other subject-areas, with the major difference occurring in the frequency of Type B.1 ventures (one cause given, and one effect discussed). Not included in the table is the fact that the major contribution to this sub-category comes from five lessons recorded in a chemistry class. It is to be expected that causal ventures would be concentrated in science and social studies, since these fields consist in empirical forms of knowledge.

With the exception of the large number of Type B.1 ventures recorded in lessons in science subjects, it appears that ventures in which an effect is given and causes discussed are relatively more frequent than ventures in which the discussion centers on effects.

Table 7. Types of Causal Ventures

Type of Venture	Type of Subject-Area				
	History	Science	Core + Sociology	English	Total
A. Effect given and cause discussed					
A.1 One effect + one cause	7	8	3	1	19
A.2 One effect + multiple causes	6	8	5		19
A.3 Multiple effects + causes	5	1			6
B. Cause given and effects discussed					
B.1 One cause + one effect	1	21	1		23
B.2 One cause + multiple effects	3	2	3		8
B.3 Multiple causes + effects		2	1		3
C. Abortive ventures					
C.1 Effect given but no cause	1	3		1	5
C.2 Cause given but no effect		1	2	1	4
Totals	23	46	15	3	87
Number of lessons recorded	19	20	8	15	67*

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* Includes lessons recorded in mathematics in which no cause ventures occurred.

Kinds of Discussion. In Table 8 the frequency with which different kinds of discussion of causes (or effects) occurred, is reported. The discussion units on which this table is based are the logical sub-units described above. When only one cause (or effect) is identified in a venture, the discussion unit consists of the whole venture. When more than one cause (or effect) is identified in a venture, the discussion units each consist of the move in which a cause (or effect) is identified together with all the other moves which relate directly to that cause (or effect).

It should be noted that there are a few cases in which the discussion relevant to a particular cause is interrupted by either the identification or discussion of another cause or both. In these cases, the discussion relevant to a particular cause is included in the same discussion unit with the identification of the cause, even though it is sequentially displaced in the venture. In most cases, the discussion relevant to a particular cause is sequentially adjacent to the identification of that cause. The same holds, of course, for the identification and discussion of effects.

The most common pattern of discussion is one in which a cause (or effect) is identified without elaboration of any kind. This pattern occurs most commonly in ventures in which there is a listing of alternative or parallel causes or effects.

Explication, evidencing, and explaining of the cause (descriptive moves) are the most common addition to identification of either a cause or effect.

In approximately 30% of the discussions of a cause or of an effect, relational moves are included.

Table 8. Combinations of Moves in Causal Ventures

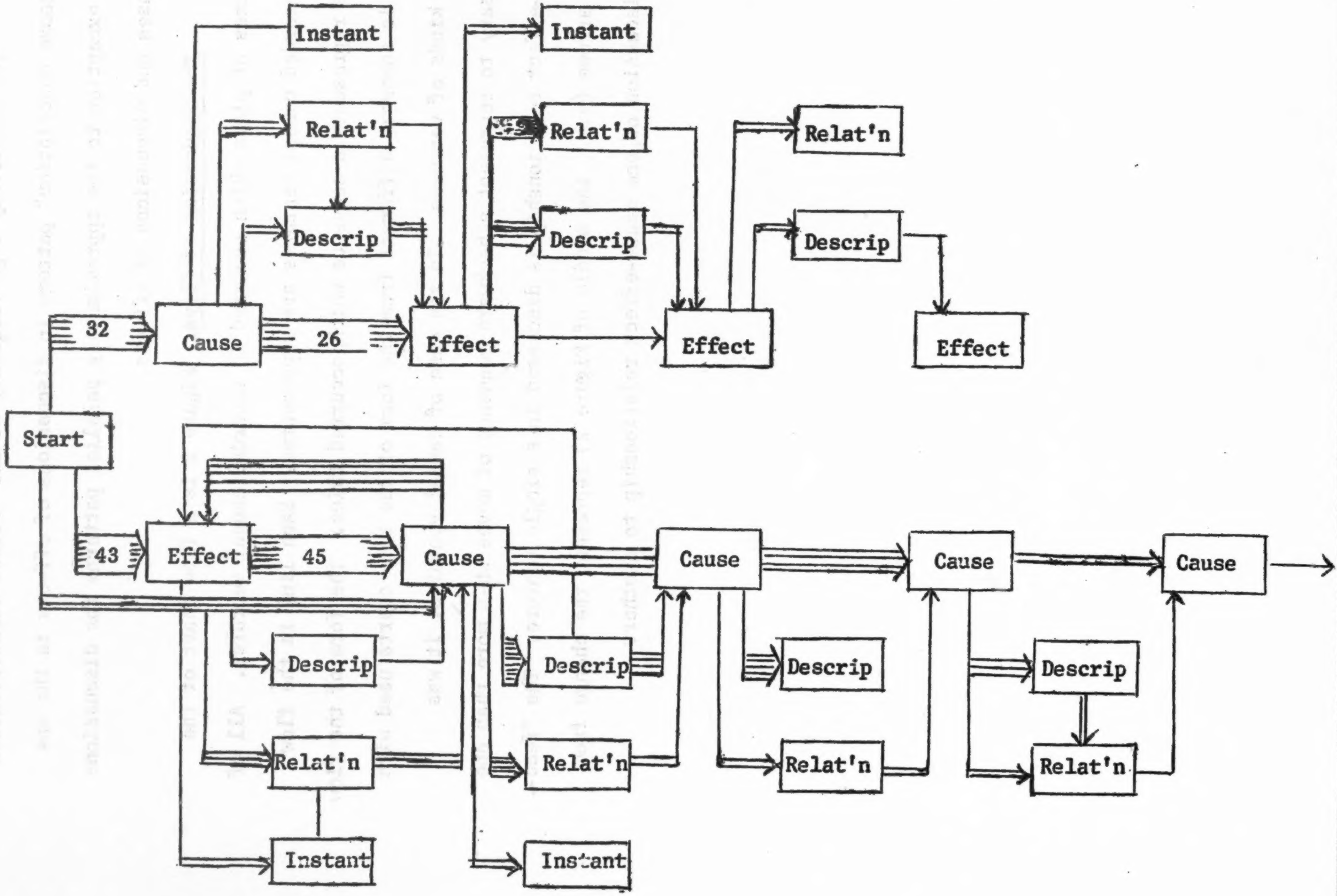
A. Discussion of Causes (Type A Ventures)	Frequency
1. Cause identification only	31
2. Identification + cause description moves	25
3. Identification + effect description moves	2
4. Identification + relational moves	19
5. Identification + instantial moves	6
6. Identification + cause description + relational moves	10
7. Identification + effect description + relational moves	2
8. Other combinations of moves	4
Total	99

B. Discussion of Effects (Type B Ventures)	
1. Effect identification only	12
2. Identification + cause description moves	11
3. Identification + effect description moves	2
4. Identification + relational moves	8
5. Identification + instantial moves	2
6. Identification + cause description + effect description	3
7. Identification + cause description + relational moves	4
8. Identification + effect description + relational moves	3
9. Other combinations of moves	4
Total	49

The relatively high frequency of the "Effect identification plus cause description" pattern in discussions of effects is the one major exception to the approximately parallel patterns for discussions of causes and discussions of effects.

The Sequencing of Plays. Figure 2 is a flow chart of the sequences of plays which occurred in recorded causal ventures. All of the recorded causal ventures are represented. Each line in the flow charts represents a sequence which occurred twice. The form of the flow chart is somewhat different from the form of the flow charts used with other kinds of ventures. In the case of causal ventures, it was necessary to represent a backward sequence of moves when more than one cause-effect relationship is discussed in a single venture. The "feedback" arrows (e.g., the middle of Figure 2) represent the change from the discussion of one cause-effect relationship to another.

Figure 2. Flow Chart of Play Sequences in 87 Causal Ventures


Start
32
Cause
26
Effect
Effect
Effect
Instant
Relat'n
Descrip
Instant
Relat'n
Descrip
Relat'n
Descrip
43
Effect
45
Cause
Cause
Cause
Cause
Descrip
Relat'n
Instant
Descrip
Relat'n
Instant
Descrip
Relat'n
Descrip
Relat'n

Chapter VIII

ANALYSIS OF REASON VENTURES

A reason venture is a discussion concerned with the reasons someone has for doing something or for deciding to do something. The term 'reason' is being used here in a somewhat narrower sense than that in which it is ordinarily used. By 'reason' is meant something a person takes into consideration in deciding to perform an action. So, to give reasons for an action is one way of explaining why the action was undertaken.

The Nature of Reason Ventures

Considerations which lead a person to take an action are of several types. Notice the different sorts of reasons that can be given to explain the German invasion of Russia in the Second World War.

cause ? (a) The German government wanted to secure its eastern frontier.

(b) The German government believed Russia's capacity to wage war threatened the security of its eastern frontier.

(c) An invasion of Russia would result in a speedy defeat of Russia.

Reason (a) gives the purpose that Hitler's government wanted to achieve by invading Russia. Reason (b) gives the government's beliefs about the context in which it had to act to achieve its purpose. Reason (c) gives a probable consequence of the invasion, a consideration relevant to the government's decision.

Still another kind of consideration may be offered as a reason. For example, one may give as a reason for using the expression 'walk slowly' (as opposed to 'walk slow') the rule that verbs are to be modified by adverbs. Thus a rule which authorizes the action may be given as a reason for it. To summarize, reasons include the purpose of the action, facts or beliefs about the situation in which action is to be taken to fulfill the purpose, facts or beliefs about the consequences of the action, and rules which can be used to authorize or justify the action.

Several different kinds of action may be accounted for in reason ventures. As the term 'action' is used here, it refers to practices, decisions and attitudes as well as to activities of individuals. The actor may be a society, a group of persons, or a single person. The following list is representative of the actions explained in our sample of reason ventures.

(a) The practice of sentencing convicted criminals to prison terms much longer than they are likely to be alive.

(b) The Negroes' attempt to enter a Little Rock high school.

(c) The federal government's not passing labor laws in the early days of labor unions.

(d) An author's naming a book "One Day After Another."

(e) The United States' practicing imperialism.

(f) Puerto Rico's not being included in the Union as a state.

(g) Americans considering Russia imperialistic.

As example (c) indicates, not doing something may be considered as an action to be accounted for.

Reason ventures and causal ventures can be easily mistaken for one another. Reasons and causes can both be used as explanatory principles. However, they are distinguished by two features. First, causes can be given to explain other events as well as actions, whereas reasons can be given to explain only actions. We can, for example, speak of the cause of a gas's expanding but not of its reasons for expanding. Gases do not have reasons. That is, they do not have purposes or beliefs on which they act.

The second distinguishing factor is that reasons are considerations which a person takes into account and which lead him to act in a certain way. This is not true of causes. Causes of a person's action are not what the actor takes into consideration in deciding upon his action. This point can be made clearer by an example. Suppose we want to explain why Johnny, upon leaving school, pushed aside the child in front of him. Two sorts of explanations are possible.

(a) Johnny pushed the child in front of him because he wanted to be the first person to get to the swings. He thought he could be first if he got past the child in front of him quickly.

(b) Johnny pushed the child in front of him because he was frustrated in his attempts to learn what was being taught in school that day. Frustration produces aggression. Pushing the child in front of him was a manifestation of Johnny's aggression.

Explanation (a) gives Johnny's reasons for pushing, i.e., it gives the considerations Johnny took into account which led him to push. Explanation (b) gives the cause of Johnny's action. This cause was not something Johnny took into consideration in deciding to push. He did not think, "I'm frustrated so I'll push this boy in front of me."

Giving reasons and giving causes are two different modes of explanation: the behavior of a person can be accounted for by either causes or reasons. To explain it by giving causes is to treat it as an event, no different from other events. To explain it in terms of reasons is to regard it in its distinctively human sense. This distinction between causes and reasons is widely used in philosophical literature. However, it is not fully in accord with the way in which the words 'cause' and 'reason' are commonly used, for in ordinary discourse these words are often used interchangeably. The discrepancy between the ordinary use of 'reasons' and the more strict use of it must be kept in mind if the reader is to avoid confusion.

Since rules may be offered as reasons, the difference between reason ventures and rule ventures will be pointed out. In most reason ventures rules are not given as reasons, so the percentage of confusing cases is small. Primarily, the difference between rule ventures and those reason ventures which involve rules is one of emphasis. If a discussion is primarily concerned with why one particular action was taken and a rule is given to account for the action, it is a reason venture. If a discussion is primarily concerned with formulating and understanding a rule, it is a rule venture. This distinction holds, even though in rule ventures students may be required to describe one or more actions in accord with the rule and to justify them as cases of following the rule.

Grouping of Moves in Reason Ventures

The moves in reason ventures are best understood when seen in relation to two basic models of reason-giving explanation. Model A has three primary elements: the action being explained; the motivating purpose or value orientation underlying the action; the beliefs about matters of fact which lead the actor to conclude that the action will achieve his purpose. Model B also has three elements: the action being explained; a rule which authorizes the action; beliefs about matters of fact which lead the author to conclude that the action is in accord with the rule.

There are thus four different elements used in the two models: action, purpose, rule, and factual considerations. Each move in a reason venture gives an item of information relevant to one or another of these elements. The various kinds of moves are listed in groups according to the element in the models to which they relate.

I Action elaboration moves. Moves in this category give information concerning the action being accounted for in the venture.

1. Action identifying.
2. Action substantiating.

II Purpose elaboration moves. Moves in this category give information relating to the purpose of the action.

3. Purpose identifying.
4. Purpose evidencing.
5. Purpose explaining.
6. Purpose justifying.

III Rule centered moves.

7. Rule citing.
8. Rule applying.

IV Factual consideration moves. Moves in this category give information concerning facts, or beliefs about facts, assumed to have been taken into consideration by the actor in deciding upon his action.

9. Context describing.
10. Consequence identifying.

Analysis of Moves.

Action identifying moves. This type of move mentions or discusses some action, practice, decision, or attitude in a context which makes it clear that one of these is the action for which the venture supplies reasons. There is never more than one action identified in a reason venture. However, there may be more than one action identifying move, since the same action may be referred to or described in several different places in the venture.

Example one is an action identifying move which occurred at the beginning of a venture in an English class.

Example 1

> T: And the mother noticed several times that there was an ominous silence. That was always an indication of what? Why did she call it an 'ominous' silence?

This move illustrates one of the most direct and frequently used ways of identifying something as the action; namely, by asking why it was done. In this case, the mother's calling something an ominous silence is identified as the action to be accounted for.

Action substantiating moves. Several different kinds of information may be presented in this kind of move. The move may assert that the action did not occur. It may give evidence indicating either that the action did occur or that it did not occur. Or it may note that the practice is not always followed. The point is that the move either defends or attacks the claim that the action did occur.

The move in Example 2 occurred in a venture concerned with the reasons why Congress did little to solve the depression of 1837.

Example 2

> S: Well, in my opinion, I think they tried. In fact, it said . . .
> T: No, they didn't.

S: It [book] said that most of Congress' work was about the economic situation during all of Van Buren's term, but that they just couldn't do anything for it.
T: Well, they actually took no real steps to solve this problem.

The student begins by merely denying that the action (doing little about the depression) actually occurred. After the teacher reaffirms the occurrence of the action, the student attempts to give evidence showing that the action did not occur. In this case the evidence is a statement in a book to the effect that Congress tried but in fact could do nothing about the economic situation. The move ends with the teacher again affirming that the action occurred.

Purpose identifying moves. To give the purpose of an action is typically to tell what the actor intended to achieve by it. A purpose identifying move may include either this type of information or information about the values which led the actor to take the action. These two kinds of purposes will be made clear in the examples below.

The purpose identifying move in Example 3 is taken from a biology venture concerned with the reasons why a "real thinker" asks a question.

Example 3

S: To learn information?
T: Learn information, yes.

This move identifies learning information as the goal or purpose a person intends to achieve by the action--asking a question.

The next example is from a history class. The central concern in the venture is why Americans consider Russia to be imperialistic.

Example 4

S: And these people in the United States who have these freedoms are against that [depriving colonies of freedom of speech and press].

In this case the student notes that Americans value freedom of speech and freedom of the press. This is stated in a context which implies that the student thinks this value, denied by Russia, is what leads Americans to regard Russia as imperialistic.

Purpose evidencing moves. Any information bearing on the question of whether the actor did actually have the purpose attributed to him constitutes a purpose evidencing move. Naturally, such a move occurs only in a venture where a purpose or intention is attributed to a person.

An example of this move is found in a literature lesson about a Graham Greene novel in which the central character is named Scobie. Discussion in the venture is concerned with the reason why Scobie keeps secrets or hides things from his wife. The purpose attributed to Scobie is that it is important to him to make his marriage a success.

Example 5

> T: It's obvious that their relationship isn't
> what it should be, but he never considers
> divorce. Therefore---

The fact that Scobie never considers divorce despite his poor relationship with his wife supports the contention that he did have the purpose attributed to him. That is to say, it supports the contention that he did think it important to make his marriage a success.

Purpose explaining moves. Occasionally, the teacher and the students are not content with knowing the purpose of the action. They want to know why the actor had the purpose. Information which answers this question constitutes a purpose explaining move. This sort of move has the effect of focusing discussion on more basic factors influencing the action. Thus, in a sense, it introduces more depth into a discussion of reasons.

The purpose explaining move given below occurred in the venture just referred to above--the one dealing with the reasons why Scobie kept things from his wife. The purpose attributed to Scobie is that of wanting to make his marriage a success. In Example 6 this purpose is noted and accounted for.

Example 6

> T: Now, Scobie's a Catholic isn't he? So it's important to him to make his marriage a success.

Only the first statement in this example is included in the purpose explaining move. Scobie's being a Catholic accounts for his having the purpose of wanting to make his marriage a success. The teacher assumes that his students know the Catholic position on divorce.

Purpose justifying moves. Utterances falling into this category give information relevant to the claim that the actor's purpose or value orientation is justified. Consider the following example dealing with the reasons for which the United States practices imperialism. It has been suggested that the purpose behind this practice is to keep other countries from being taken over by Communism.

Example 7

> S: If certain countries did come under Communist rule--well, the more land Communists rule, the harder it's going to be if a war ever does break out between the United States and them, because they'll have all this power, and more trading spots can be cut off from the United States.

This move gives information to justify the purpose--keeping Communists from taking over countries. The information consists in indicating the disadvantage of not achieving the purpose. In this case, the disadvantages are that in the event of war between Communists and the United States, Communists would be more powerful and would be in a better position to cut off the trade of the United States.

To justify a purpose is to do something very close to explaining it. To explain a purpose is to tell what factors are associated with a person's having the purpose. To justify a purpose, on the other hand, is to tell what makes the purpose a good thing to achieve. Distinguishing these two activities is not always an easy task. A response to the question: "Why did he want to achieve purpose X?" may be either a justification or an explanation. It may tell either why X is a good thing or why the actor wanted X. The matter is complicated by the fact that many justifications are, in a sense, explanations. The considerations which justify a purpose may also be the considerations which lead a person to have the purpose. To deal with such complications, a consistent procedure was followed: any move containing information relevant to the determination of the goodness or badness of the purpose was classified as a purpose justifying move, even if it might also account for the actor's having the purpose.

Rule citing moves. One sort of reason given for an action is a rule which authorizes the action. For example, one could give, as his reason for driving on the right-hand side of the road, the rule that all motor vehicles in the United States are to be driven only on the right-hand side. To give a rule which authorizes the action is to make a rule citing move.

The rule citing move in Example 8 occurred as part of a venture concerned with the reasons which prohibit a person from being re-tried for a crime once he has been acquitted of it.

Example 8

> T: There's something in the Constitution--you can't be put twice in jeopardy, twice within the same offense period.

The rule about double jeopardy is cited in this move to account for the practice of not trying a person twice for the same crime. This rule authorizes the practice in that it prohibits re-trial.

Rule applying moves. This type of move gives information relevant to deciding whether the action under discussion is or is not a case of following a given rule.

The example below is concerned with the reasons why no national labor laws were passed in the early days of labor organizations. To account for the action--failing to pass national labor laws--a student has referred to the rule that the federal government can exercise only that power delegated to it in the Constitution.

Example 9

> T: Well, we do it now. We get by with it in the Constitution.
> S: Because it's reasonable and proper--
> T: Well, why wasn't it reasonable and proper then? You're walking down the right road, keep going.
> S: It hadn't come to the point that it was a national issue.
> T: Yes. So, then, labor didn't affect the interstate commerce as they called interstate commerce in those days. Labor was a local operation. It was a local matter between the owner of this little shop or factory and his employees.

The teacher's first utterance constitutes a rule applying move indicating that the rule cited--namely, the federal government can exercise only that power given to it by the Constitution--does not seem to apply to the failure to pass labor laws. In saying the Constitution allows national labor legislation now, the teacher is implying that perhaps it could have been allowed in the earlier period as well. If this is the case, then the rule does not apply to the action. This apparent discrepancy must be accounted for. This is done in the last two utterances where a change in the status of labor is cited as the basis of the rule's applicability in the earlier period as well as today.

Context describing moves. One sort of reason given for an action is some fact, or belief about a fact, which is assumed to have been taken into account by the actor when he decided to perform the action. Such factual considerations include characteristics of objects or persons toward which the action is directed and characteristics of the environment in which the action takes place. Any information concerning either type of characteristic, or the actor's belief about them, constitutes a context describing move.

The example cited below occurred as part of a venture that dealt with the reasons why the United States treated Hawaii, the Philippines, and Puerto Rico differently.

Example 10

S: Well, in Puerto Rico and in the Philippines the people were pretty illiterate.
T: What about Hawaii? Weren't there a lot of natives in Hawaii?
S: Well, not as many as the other two. Well, there were more Americans over there.
T: O.K. There, the people who had been responsible for the revolt against the authorities in Hawaii were American planters. That was a much larger population. Did people of the Philippines ever become interested in becoming citizens of the United States, or did they want something else? Did the majority of them want to be citizens of the United States or were they interested in another type of government.
S: They wanted to be citizens but they wanted independence.
T: They wanted independence more than anything else.

This move presents a number of facts that the government of the United States is assumed to have taken into account in deciding to treat the three island groups differently. These include different standards of literacy among the three, and different desires concerning independence. Each of these facts concerns characteristics of the island people toward which the actions were directed.

Consequence identifying moves. Information describing the consequences or results of an action as well as information concerning the actor's beliefs about the probability of such consequences fall into this category. Consequences of the action have much the same role as characteristics of the action context. They are sometimes offered as justification for the action, and at other times such consequences are taken into account by the actor in deciding upon the action.

This sort of move is exemplified in the following utterance taken from a venture that dealt with the reasons why Jackson favored the idea of driving the Indians westward.

Example 11

> S: Because it increased the westward movement--
> toward the West [movement of settlers].

This move gives the consequences of driving the Indians westward. It is assumed that Jackson was aware of these probable consequences and that they entered into his decision to favor driving the Indians further into the West.

Both context describing and consequence identifying moves give facts or beliefs assumed to have been considered by the actor. They often occur in ventures in which the purpose of the action is also identified. They are related to the purpose in that consideration of them may lead to the conclusion that the action will achieve the purpose. Consider Example 11 again. Jackson's purpose was to facilitate settlement of the West. The probable consequences of driving the Indians westward would be an increase in the number of settlers moving into the West. Hence, the action of driving the Indians westward would serve Jackson's purpose.

Because of the close relationship between factual considerations and purposes it is possible to infer the general nature of the purpose from the factual considerations given as reasons for the action. Thus, many ventures contain context describing and consequence identifying moves but no purpose identifying move, the purpose being implicit in the factual considerations advanced.

School Subjects and Reason Ventures

Reason ventures are apt to be associated more closely with subjects that treat human action than with those that stress explanations of physical and biological events. The 33 reason ventures comprising our sample were distributed as shown in Table 9.

Table 9. Frequency of Reason Ventures by Subjects

	History	English	Sociology	Core	Science*	Geometry
Reason Ventures	22	4	3	3	1	0
All Ventures	151	127	35	46	243	35
Ratio of Reason Ventures	1 in 7	1 in 32	1 in 12	1 in 15	1 in 243	0 in 35

* Physics, chemistry, biology, physiology

While the sample of reason ventures is small, there are few, if any, theoretical grounds for supposing that the distribution of these ventures by subjects would be markedly different in a larger sample. The heavy concentration of reason ventures in history was to be expected, since this subject deals, among other things, with the question of why persons and groups took certain actions. Nor was the small ratio of reason ventures in science surprising. To some readers the absence of reason ventures in geometry will seem incredible. For, after all, does not a geometry lesson consist partly in the giving of reasons for conclusions? But the absence of reason ventures can be attributed to the fact that the teacher of geometry is primarily concerned with formulating and understanding rules and the use of them in reasoning rather than with a particular action and the use of a rule in accounting for it. All of the reason ventures in English were about the actions of literary characters.

Patterns of Moves in Reason Ventures

A great many different combinations of moves occur in reason ventures. The task of describing these combinations is made manageable by classifying moves into a smaller number of categories. The classification used in this analysis differs from that used to group moves into types. In that form of grouping, moves were classified according to the element of the model about which they gave information. In the present grouping, moves with the same logical function are classed together. Following that principle, reason moves fall into the following groups:

- Class A--Identifying
    - Action identifying

- Class B--Moves giving motivating reasons
    - Purpose identifying
    - Rule citing

Class C--Moves giving factual reasons
  Context describing
  Rule applying
  Consequence identifying

Class D--Moves concerned with evidence
  Action substantiating
  Purpose evidencing

Class E--Moves accounting for the purpose
  Purpose explaining
  Purpose justifying

Several observations about combinations of moves may be derived from logical considerations. Such considerations tell us that every venture must contain an A move and either a B move or a C move. Also it is apparent that a venture cannot contain an E move unless it contains a B move.

Table 10 provides a taxonomy of the kinds of reason venture found. The ventures were classified according to the classes that were represented by the moves that occurred in them. For example, there is one venture which has one or more moves from Class A and one or more moves from Class B, but no moves from any other class. Again, there are six ventures which have one or more moves from Class A and one or more moves from Class C, but no moves from any other class.

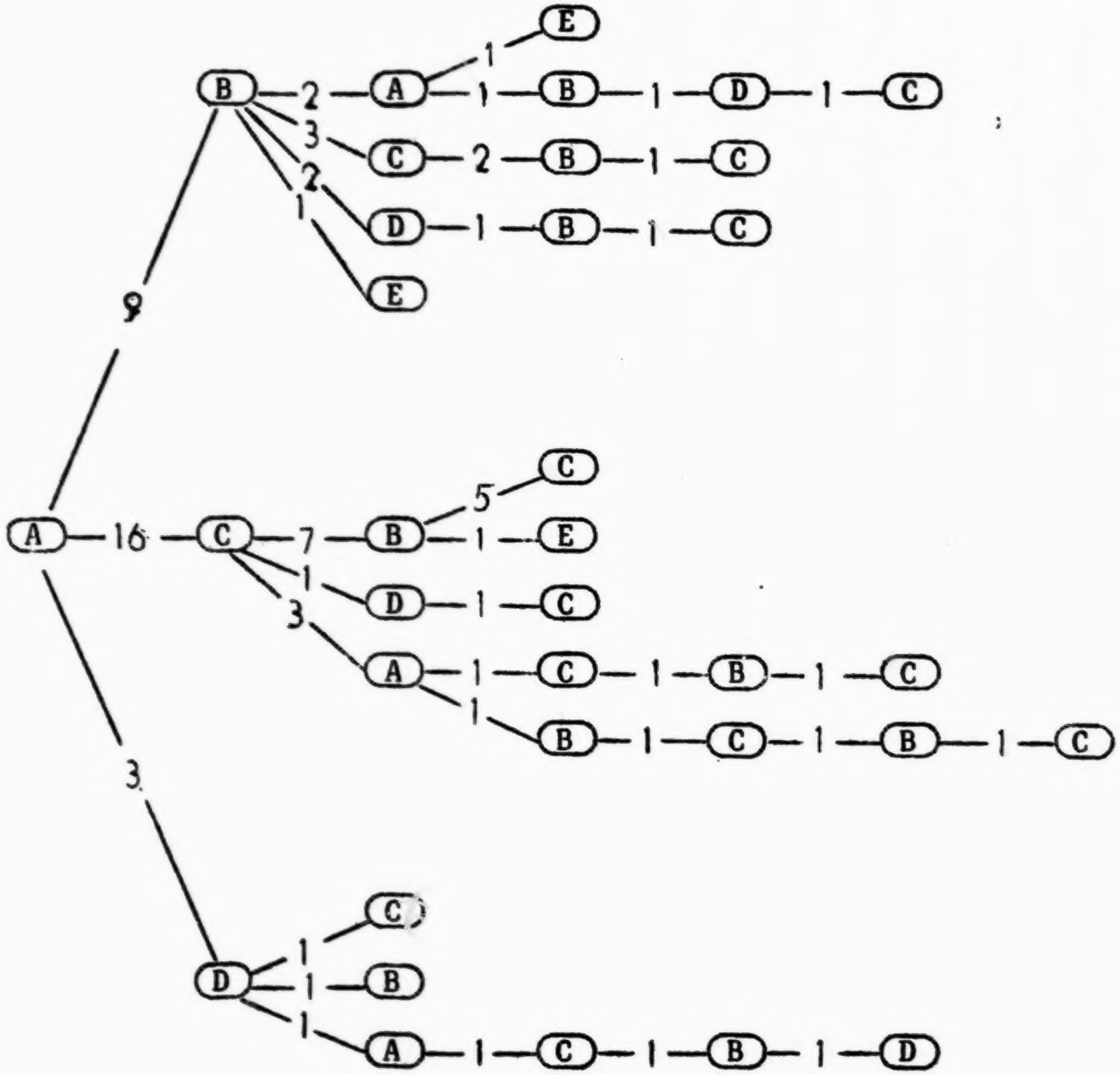
Table 10. Types of Reason Ventures

Move classes represented in venture	Number of ventures of each type
AB	1
AC	6
ABC	14
ABD	2
ABE	2
ACD	2
ABCD	4
ABCE	3
Total	34

Since the sample of reason ventures is small, it would be unwise to attempt to draw any strong conclusions from it. Still, it is interesting to note that the venture type ABC occurs 41 percent of the time. That is to say, in forty-one ventures in a hundred, moves are utilized which identify the action, which give motivating reasons for the action, and which give factual considerations that the actor may have taken into account. The table also indicates that no venture was observed in which moves from all classes were utilized, and indeed only seven ventures contain moves from more than three classes. This suggests that reason ventures exhibit less logical complexity than is theoretically possible.

In describing the sequencing of moves in reason ventures the same move classes have been used in conjunction with the play concept. The procedure adopted was as follows. The original markings of the venture were examined: suppose these moves were 1-9-9-3-4-5-6. Each move was then coded according to the class which it represented. Our hypothetical example would then have the sequence A/CC/B/D/EE. The notion of play was then applied to the coded moves and the example was then coded as A/C/B/D/E. It was felt that by this coding the sequence which was used for the description of moves in reason ventures would represent changes in the logical function that moves were fulfilling in the venture. Figure 3 provides a diagrammatic description of the sequencing of all those ventures which began with an A (identification of action) play. Six ventures were omitted from the figure as they did not begin in this way.

Figure 3. Sequence of Plays of Different Classes in Reason Ventures*


A
9
16
3
B
2
3
2
1
A
1
E
1
B
1
D
1
C
C
2
B
1
C
D
1
B
1
C
E
C
7
1
3
B
5
C
1
E
D
1
C
A
1
C
1
B
1
C
1
B
1
C
1
B
1
C
D
1
C
1
B
1
A
1
C
1
B
1
D

* Six ventures were omitted as they did not begin with an A play.

The number of plays immediately following a given type in a sequence is indicated by numerals in the lines. For example, there are 16 C plays that follow A plays and 3 D plays following A plays.

It can be seen that twenty-eight of the thirty-four reason ventures begin with an A play. That is, the first logical function fulfilled was the identification of the action. The figure does not reveal a great deal of structure in the middle stages of ventures, but it should be noted that the second play in 57 percent of the ventures is the type that gives factual reasons and in 32 percent the second play gives motivating reasons. In other words, 89 percent of the second plays are concerned with some form of reason giving. The ventures tend to end with C plays. Although it is not explicitly given in Figure 3, eighteen of the twenty-eight ventures, or about 64 percent, have C plays at the end.

The analysis of the sequencing of moves in reason ventures using the play based on classes of moves suggests then that there is a strong tendency to open ventures with an identification of the action followed by a reason giving play. In addition, there is a fairly strong tendency to conclude the venture with a play giving factual considerations which the actor presumably took into account when coming to his decision.

Chapter IX

ANALYSIS OF EVALUATIVE VENTURES

Just as the term "evaluation" occurs in many different domains of discourse, so the process of evaluation is no one's prerogative. In one sense or another the mathematician, the sociologist, the educator, the philosopher, the critic and the common man evaluate. And the types of evaluative activities that they carry on are complex and diverse.

Evaluation is here taken to be a process in which a certain sort of evaluative term is applied to a certain sort of object, the application constituting a rating. This is the central aspect of the evaluative process. But a mere rating constitutes an impoverished form of evaluation, although there may be occasions when this is all that is required. To make a justified rating it is necessary to provide at least two further ingredients. One should be able to explicate the value term and thus provide criteria of its application. To provide criteria is to give some specification of those properties of value objects that must be taken into account when a decision is to be made about the applicability of the value term to an object. But further, if the rating of any particular value object is to be justified, as distinct from our knowledge of the meaning and significance of the rating term, it will be necessary to show that the particular value object has properties such that the value term is or is not applicable to it. This can be done by providing some form of relevant description of the value object. The model of evaluation thus becomes quite complex, and is reflected in those evaluative ventures which are pedagogically most interesting.

In our analysis of ventures, five essential activities have been distinguished: identifying the value object; identifying the value term; explicating the value term and providing criteria of its application; describing properties of the value object as well as consequences that are relevant to the evaluative criteria; and making the rating. These constitute a circle of interrelated activities. It is possible, however, to go outside of this circle and to engage in another activity that bears on the rating given, especially where the rating is problematic in some way. Thus one might consider the accepted ratings of different but similar objects, or resort to some authority in whose evaluations one puts greater trust, or introduce difficulties that arise when other evaluations of the same object are taken into account. Generally, this diverse range of activities can be thought of as giving relational arguments.

As the presentation above is rather compact, a brief discussion will be given of each of the activities making up the process of evaluation.

The expression "value object" may be misleading. The value object does not have to be an object in the everyday sense of the word, and indeed it is not usually so. "Object" is used as a very general term, with no restrictions on the range of entities that it can cover. The term "thing" is used in this general sense in some discussions. People, events, beliefs, actions, policies, practices, arguments, nations, and so on can be evaluated. Any thing that one can think of might well be evaluated in the classroom, although value objects will usually be concerned in some way with human beings and their actions. Furthermore, an object to be evaluated need not be one that is of great worth or one that embodies an obvious moral interest. The very pedestrian and humble can become "value objects" as much as the noble or mighty. In the phrase "value object" then, the term "value" is used to indicate merely that the object has been selected for evaluation in the venture.

The value term will probably be an explicitly normative word or phrase. Words like "good," "bad," "fair," "right," "reasonable," "correct," "worthwhile," are useful indicators that an evaluation is called for. There are various sorts of words that may involve teachers and students in a discussion of values because they carry a strong evaluative reference as well as descriptive reference. Terms such as "honesty," "corruption," "decadent" often serve as value terms of this sort.

It is of considerable interest to those who are concerned with moral matters to know the evaluative and ethical force of value terms, but in the present analysis more emphasis is placed upon the provision of criteria by consideration of the value term; that is, the criteria by which one knows when to say, for instance, that an object is good. The process by which such criteria are established is complex and probably of great interest, but at the level of discourse covered by the ventures it is probably more important that criteria be given rather than justified. At least one finds in the ventures almost no discussion of the justification of criteria.

The description of relevant properties of the value object requires that a distinction be drawn between those properties an object has which are covered by the evaluative criteria and those which are not relevant to these criteria. (In move formulations this distinction is reflected in the difference between the descriptive and the tangential moves.) Clear explication of the criteria of application is necessary if the student is to be able to provide, from such sources as texts or experience, a description of those properties of the object which are crucial in its evaluation.

The process of making a justified rating can now be characterized. The evaluator must know the particular value object to be rated; he must understand the value term which is to be applied to or withheld from the particular object; he must know the properties which are criterial for the value term in relation to the kind of object being evaluated; and he must know whether or not the particular object has the properties. The justified rating process would then consist of a comparison of the criterial properties of the value term for the particular value object with the actual qualities of the particular value object, and an assignation of the value term to the object if it has the criterial properties or a withholding of the value term if it lacks these properties.

This obviously is a somewhat demanding model of evaluation. It is likely that it would seldom be used as a pedagogical model. And, evaluations carried out in the classroom should not always be considered poor because they fail to meet it. In point of fact, very few ventures contain evaluations of this degree of subtlety.

Groups of Moves in Evaluative Ventures

Six different groups of moves have been recognized in evaluative ventures as follows: identification; description, rating; criterial; relational; tangential.*

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* For a quick review of the moves within each of these general classes see Appendix II.

In the identification category there is only one move and this is concerned with the identification of either the object to be valued or the value term to be applied to or withheld from the value object as the rating is made. Only one move is used for these two identifications as they frequently occur in very close proximity ("Is this a good joke?") or one may even straddle the other ("Does this letter express its message well?")

Descriptive moves characterize the value object in ways that are relevant to the judgment that an evaluator will make about it. In many cases these moves provide factual description directly, or by descriptive classification, or by comparison of instances where the value object is a general class (two murders might be compared if the value object is murder).

Rating moves are the crux of evaluative ventures, for such ventures would be abortive were no rating given. Ratings may be made of the value object as a complete entity, its characteristics, or instances when the value object is general rather than particular.

Criterial moves are concerned with the explication of the meaning of the term or with the related process of explicitly stating the criteria that govern the use of the term in the particular rating. Although the ability to state criteria is important in the rational formulation and justification of evaluations, they are less than primary as a rating can be made even if criteria are not stated. This group includes moves in which the criteria themselves are defended or rejected, or in which the value term itself is classed as irrelevant to the object under consideration.

Relational moves are those which bear upon the justification of a rating and are extraneous to the criteria. They include information which goes beyond that contained in the first four groups of moves, and, like criterial moves, are used to support or refute some rating. For example, authority may be cited which serves to offer some support for the proffered rating.

Tangential evidence moves provide supplementary information about the value object which is not directly relevant to its rating. The information is not descriptive of characteristics relevant to the rating criteria. However, the material in such moves may have content that is pedagogically significant. It is likely to occur in evaluative ventures, for in discussing a particular value object the teacher will often wish to provide a wide range of information about it.

Analysis of Moves

Identification of value objects or value term or both. The value object and value term appeared so often in a single question that we treated this as one move. Typically, this is a very brief move, as in the following example, which introduces a discussion of the fairness of authors using emotional appeal to promote an argument.

Example 1

> T: Is it fair for an author to use emotional appeal, in which to promote his argument?

Here the value object is 'the use of emotional appeal by an author to promote his argument.' The value term is 'fair.'

Occasionally the identification move contains only the value object, and the value term does not appear until the rating move is made later, as in the following opening of a discussion of the fairness of a law.

Example 2

> S: Well, about this law--according to the Constitution, it says that the House has to vote on the candidates.

Note that in this move there is no value term. The value term appears in a later move where the law is rated: 'I don't think that's fair.'

Description. In this kind of move, a description is given of the attributes, properties, etc., of the value object. When the value object is a proposition or argument, this may include discussion of the premises, assumptions, or evidence on which the argument is based. Descriptive moves are found in most of the ventures, and vary considerably in length.

In a history lesson, the claim has been made that Adams was a very strong president as an evaluation of Adams. The speaker then proceeds to explicate the value object by providing the following description of Adams:

Example 3

> S: He [Adams] didn't pay much attention to other people. He didn't change his decisions. His decisions were made on what he felt was the thing to be done and he more or less ignored what others felt. That's why he made so many enemies.

The student in this move is describing the mode of decision-making that characterized Adams when he was president. The information conveyed in the descriptive move is directly relevant to the judgment that Adams was a strong president.

Classification. This kind of move identifies the value object as a member of some more general descriptive (not normative) class of things. The following example is from a discussion about whether a certain appeal constitutes a good argument.

Example 4

T: Now, what kind of an appeal is that?
S: Mercy.

The teacher has previously listed a number of categories of appeals that are made in arguments, other than appeals to reason. Appeals to the crowd, to fear, to mercy, and to sympathy are listed. A quotation is then read, and after it is read, the classification move indicates that the argument given in the quotation involves an appeal to mercy. The classification move thus classifies a value object into some descriptive, rather than evaluative category.

Subsidiary rating. The value object in this move is given some rating different from that which forms the main point of the discussion. The rating is different because a different value term is to be applied to the object.

The following example, drawn from a lesson in English literature, occurs in a venture in which the reason for a man's breaking the law is to be evaluated primarily in terms of being right or wrong. The following subsidiary rating move occurs:

Example 5

T: What I am trying to get at is this. People break the law very often for selfish reasons. But Scobie broke the law for unselfish reasons.

The teacher has evaluated Scobie's reason for breaking the law in terms of its unselfishness, rather than in terms of its being right or wrong. Thus the teacher is giving a rating to the value object which is different from the rating--right or wrong--which forms the main point of the venture.

Instance comparison. Instances of the value object are compared in this type of move to illustrate some characteristic of the value object. The following example is from a discussion about approving a mother's way of handling discipline. Two instances of her way of handling discipline have already been given.

Example 6

> T: Then she told the one boy to fight, and she told the other son not to fight. Why is that? What was the difference?
>
> S: Well, Al, the boy who was told not to fight, has a hot temper and he always got into fights. And she was trying to teach him not to fight half as much as he was doing.

Here two instances of the value object, the mother's handling of discipline, are compared, although incompletely. It is pointed out here that she was trying to teach one boy not to fight so much, and earlier it was suggested that she was trying to teach the other boy to stand up to others more.

Consequences. In this kind of move, a description is given of the consequences, products, effects, outcomes, results, etc., of the value object. This kind of information is important in such evaluation, and we found this kind of move in about a third of the ventures. The following example, from a discussion about novelists who try to promote their point of view in a novel, occurs after the novel with a message has been compared with the factual or partisan pamphlet:

Example 7

> S: Well, when people read a message in a novel it's more parallel to everyday life. You might be able to understand it a lot better in a novel. In a pamphlet you just see facts and you wouldn't associate them with yourself, or think how you would feel and react to these things.

Here the consequences of the value object, novelists promoting their view in a novel, are pointed out, i.e., that more attention, interest and understanding of the topic will result from using the novel.

Origins. Moves of this type contain a description or discussion of the antecedents, origins, causes, or reasons for the value object. This kind of information is in a sense "opposite" to that in consequence moves.

The following example is from a discussion evaluating a mother's way of handling the discipline of her two sons.

Example 8

> T: Why do you think that this mother urged Cid to go back out and meet Tommy to fight him?
> S: I think because Tommy was older than Cid was, and because he was always beating up on Cid, you see. And that's why she sent him back out there to fight Tommy.
> T: Apparently he could hold his own or she hoped that he would learn to hold his own.

In this venture the value object is the mother's method of discipline, in this case the mother's decision to send Cid back out to face Tommy in a fight. The mother's reason for taking this action is given in the example. The reason for which the mother sends the boy out to fight is that he will learn to stand up to the older boy. The mother's reason is the source of her disciplinary action.

Instance description. In this sort of move, an instance or sub-class of the value object is named or described. Characteristics, origins, consequences, etc., may be mentioned. The following example is from a discussion of the importance of habits in our lives.

Example 9

> T: Someone has said that we are just a bundle of habits--that most of our activities we do from habit. We get up at a certain time; we eat at a certain time; we wash at a certain time; we get to a certain place at a certain time.

Habit is the value object, and in this move several instances of habits are given; e.g., getting up at a certain time, eating at a certain time.

Rating of the value object. A value term is applied to the object which forms the central topic of discussion. Ratings may vary, depending on whether a value term is applied to the value object, as in Example 10, or whether a value term is denied application to the value object, as in Example 11.

Example 10

> S: I think you had a very good report.

In the venture from which Example 10 is drawn, the value object is a report that one of the students gave in class. The other students gave ratings of the presentation. The move is the rating given by one of the students. The rating move itself is quite brief, but the student goes on in the venture to make other moves that support the rating.

Example 11 is taken from a history lesson in which the procedure for deciding between tied candidates in national elections is mentioned.

A student then makes a rating of the procedure--to let the House of Representatives have a deciding vote. The student rates the procedure by applying the value term 'fair.'

Example 11

S: I don't think that's fair.

Rating of characteristics. In this kind of move, some characteristic or relational property (origin or consequence) of the value object is rated.

In the following example, which is drawn from an evaluative venture in which the value object is imperialism, the teacher draws out a characteristic of imperialism and rates it as bad by his opening question.

Example 12

T: What are some of the bad things for a colony of an imperial power?
S: The colony is dominated by the mother country.
T: All right. Then this is loss of national . . .?
S: Prestige?
S: Spirit?
S: Nationalism?
T: Let's say loss of national identity.

Instance evaluation. Some instance or sub-class of the value object is rated. The instance may be real or it may be hypothetical.

The following example is drawn from a discussion of a mother's way of handling discipline. An instance of this has been given in the lesson--the mother sent one of her sons out to fight a boy--and this instance is rated in the following example. The teacher asks the student if he approves of the mother's decision to send the boy out to fight, and the following evaluation is made by the student.

Example 13

S: Oh, I don't know. I like to fight and wrestle. I mean, it's all right if they don't hurt each other real bad.

Explication of value term. This kind of move contains a description or discussion of the evaluative force or meaning of the value term. In the following example, a very brief move, an evaluation of imperialism focuses on the meaning of 'pro' and 'con.'

Example 14

T: What does "pro" mean and what does "con" mean? Go ahead, George.
S: "Pro" means for, and "con" means against.
T: All right.

Citing criteria. A standard or rule or some set of alternative standards or rules by which a rating of the value object can be made, are stated or discussed. There may or may not be a discussion of the relative importance of alternative standards or rules. The following example is from a discussion about whether John Quincy Adams was a strong president.

Example 15

T: You know, there's a difference in the definitions of terms here, don't you? You define 'strong presidents' as self-willed and usually defiant. But Jack has defined it as the president is strong in his ability to get his own program across.

Here alternative criteria for a strong president are clarified. One is that a strong president is one who is strong in his own opinion (sticks by principles) and the other is that a strong president is one who gets his program across.

Substantiation of criteria. Evidence for or against some criterion (standard or rule) for rating the value object is given or discussed. The following example is from a discussion about how good a man's reason is for breaking the law, the reason being that he loves mankind. A criterion has been implied that love of mankind is a good reason because it is a better reason than greed.

Example 16

B: But you can't afford to love mankind evermore, can you?
G: No.

Here the boy is saying that loving mankind is a good reason because it is hard to love mankind, in the sense that one can hardly afford to do this. The discussion suggests that he sees it as a good reason because it involves a sacrifice or hardship.

Irrelevance of value term. In this kind of move, the irrelevance of the value term, or some or all of the criteria for the value term, is asserted or discussed. Or it is asserted that the value term cannot be applied because of the lack of appropriate evidence. The following example is from a discussion of whether the Spoils System is democratic. After a student has indicated that he feels the Spoils System is not democratic, the following move occurs.

Example 17

T: I don't think that the Spoils System is a part of democracy. It's a political technique. It's a tool. It's simply one of the political techniques or tools that could be used to encourage democracy, or encourage autocracy, or encourage monarchy, or encourage any old thing.

Here the teacher is stating that the value term 'democratic' does not apply to the Spoils System, it just is not relevant. He explains his statement by pointing out that the Spoils System is just a political technique that can be used in any kind of political system.

Explanation of discordant characteristics. This move requires that some evidence or explanation be given to indicate why some characteristic, apparently discordant with or contrary to a previous rating of the value object, should be discounted or ignored.

The following example is from a history lesson, in which one student has claimed that Adams was a strong president. In the example, another student brings up a fact and demands that the first student accommodate this fact.

Example 18

T: Well, Jack, if he was such a strong president, how do you explain that he accomplished very little in his four years?
S: Because Congress wasn't backing him.

Jack had characterized a strong president as one who kept to his own opinions, not as one whose period in office was productive. He is thus able to rationalize the low productivity of Adams in a way that does not affect his previous evaluation.

Citing an alternative value object. Here an object, practice, action, etc., having a rating different than the value object under consideration, is cited or discussed. This alternative value object may be real or hypothetical.

The following example is from a discussion of the constitutional law specifying that the House of Representatives should vote on tied candidates.

Example 19

T: Well, what kind of a plan would you suggest?
S: Well, maybe both the House and the Senate should decide the outcome of the election since that's the way Congress was set up.

Here, the alternative value object is hypothetical: both the House and Senate would vote on the tied candidate. The rating here is merely implied, namely that this plan is better than the existing one.

Citing authority. In this sort of move the opinion or conclusion of some authority is cited as evidence for or against a rating of the value object. In the following example, the discussion is about whether it is picking on teenagers to connect them with so much crime.

Example 20

T: J. Edgar Hoover, perhaps, is in as good a position to know what the real situation is as anyone in the United States, and he said that the crime problem is a youth problem.
S: Essentially a youth problem?
T: Essentially a youth problem.

Here J. Edgar Hoover, a recognized authority on crime, is cited to support the view that to connect youth with the increasing crime rate is not to pick on them, but rather to state the real situation.

Implication. A rating is supported by this move on the grounds that the value object does not have the same characteristics or effects as other objects which have an opposite rating. The following example is from a discussion about the reliability of the reports in Consumer Reports.

Example 21

S: Consumer Reports has to be reliable.
T: Yes, they have to be reliable because if they put a certain company's products down in the list, say as just acceptable rather than highly acceptable, they might get into trouble from it. But if they can go back and show them the tests they used, the company has nothing to come back on.

Here the teacher is supporting the rating of the reports as reliable by implying that persons responsible for the report can squash the critics by showing that the characteristics claimed for the rated object are in fact present and that they are not the same as those of objects differently rated.

Analogy. This move likens the value object to another object customarily believed to be good or bad, or widely practiced. The following example is from a discussion about the justice of an African law specifying that a man condemned for murder should hang.

Example 22

> T: Now, in this country, in some states, we do still hang, and we have the gas chamber, and other things. Every time that a murderer is proved guilty in the State of Illinois he is condemned to death by the electric chair . . .

Here the African law, the value object, is compared to the American law, which elsewhere in the discussion has been considered a better law than the African law.

Tangential. In this kind of move, facts, beliefs, etc., which are relevant to the value object, but not directly relevant to the rating of the value object, are cited or discussed. (Also included in this category are moves in which a value object, other than the one which is central to the discussion, is rated, apparently because of misunderstanding, misinterpretation, etc.) The following example is from a discussion of the fairness of using emotional appeal to promote an author's argument.

Example 23

> T: Well, I have not had this experience as far as you are concerned, but I have heard from the principal on occasion when some student felt that I had been unfair or that I had misunderstood something. The appeal, in most cases, has been an emotional one, and very often when the three of us get together and work out the reason for the two mark instead of the one mark, we become intellectual and analyze the problem properly. Sometimes it turns out that the mark wasn't so bad after all.

Here an instance of emotional appeal is given, but it is not an instance of an author using emotional appeal. So, it is only tangential to the rating of the use of emotional appeal by authors.

Relation of Ventures to School Subjects

Evaluative ventures are more likely to be associated with school subjects that emphasize normative content than with those that consist largely of descriptive subject matter. Since our sample of ventures is small and open to the objection that it is not a random selection no generalizations can be made without risk of embarrassment. Nevertheless, it is interesting to note that the distribution of ventures by school subjects is about what would be expected from what is known about the nature of these subjects. This is evident from Table 11.

Table 11. Frequency of Evaluative Ventures by Subjects Compared With All Ventures

	History	Sociology	English	Science	Core	Geometry	Total
Evaluative Ventures	12	3	14	4	4	0	37
All Ventures	151	35	127	243	46	35	637
Percent of Evaluative Ventures	7.9	8.6	11.0	1.6	8.7	0	5.8

It can be seen that evaluative ventures account for approximately one in seventeen of the total number of ventures. If the subject areas are ranked in terms of the relative frequency of occurrence of evaluative ventures, then the following ordering results:

English (1 in 9 ventures)
Core (1 in 11 ventures)
Sociology (1 in 11 ventures)
History (1 in 13 ventures)
Science (1 in 61 ventures)
Geometry (0 in 35 ventures)

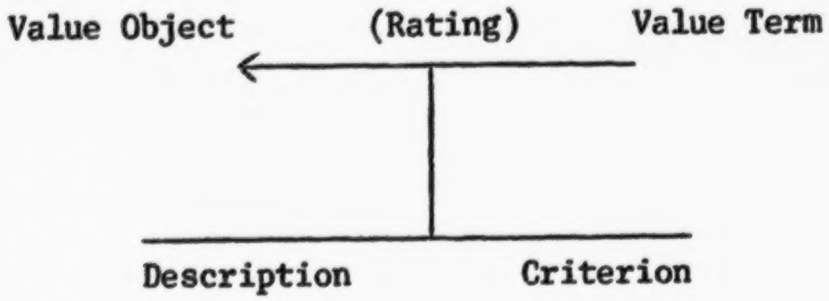
There is a relatively sharp break between two groups of subject areas. Evaluative ventures occur much less frequently in geometry and physics than they do in the other subjects. Presumably, this reflects the fact that neither of these two disciplines has a strong normative content, whereas normative and hence evaluative elements are likely to occur in the instructional content of the humanities and social sciences. The distribution of evaluative ventures thus tends to confirm commonsense expectations.

Kinds of Evaluative Ventures

It was noted above that moves in evaluative ventures fall into six general classes. It is pedagogically interesting to know whether or not all of these moves appear in all ventures and what sorts of structures these moves give rise to in the ventures.

The pattern of elements in a venture where a fully justified evaluative assertion is made provides an appropriate "ideal" form to use as a basis for distinguishing types of evaluative structures. The model we have found to be useful is actually a rather simple one, involving only four "elements." The first element is the thing being evaluated, which we call the *value object*. The second element is the term which is applied to the value object. This term is called the *value term*. (A statement which applies a value term to a value object is called a *rating*.) The third element is the *description*. The fourth element is the *criterion*.[1] These elements and some of the important relations among them can be represented schematically as in Figure 4.

Figure 4. A Logical Model of Evaluation



The upper horizontal line, an arrow, represents the application of the value term to the value object, constituting a rating. The lower horizontal line over both "description" and "criterion" is to represent that description and criterion must *both* be present to provide support for the rating. (Description is placed on the side of the value object as a reminder that it refers to the value object.) The vertical line represents the support of the rating more specifically, and is put in both to represent that the rating is like a conclusion in an argument and to represent clearly the strength of support by varying the thickness or solidity of the line.

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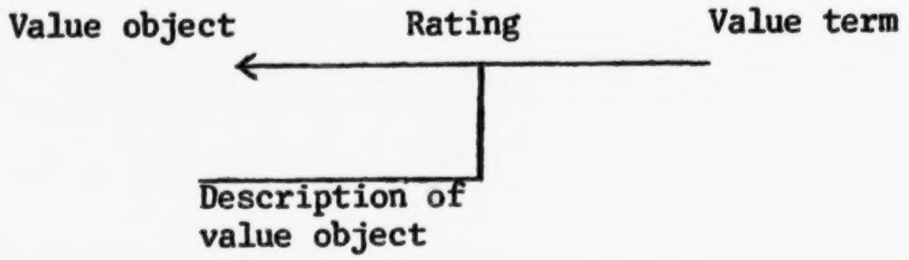
[1] The term 'criterion' is used here in a rather ordinary, nontechnical way.

Examination of the recorded sequences of moves suggested that there are three major variations of this model: (1) ventures in which all the components of the structure are present with the exception of a discussion of criteria, (2) ventures in which discussion of criteria is omitted, but some other form of justification (e.g., citing an authority) is included, (3) ventures in which there is discussion of the criteria, and some other form of justification of the evaluation is also included.

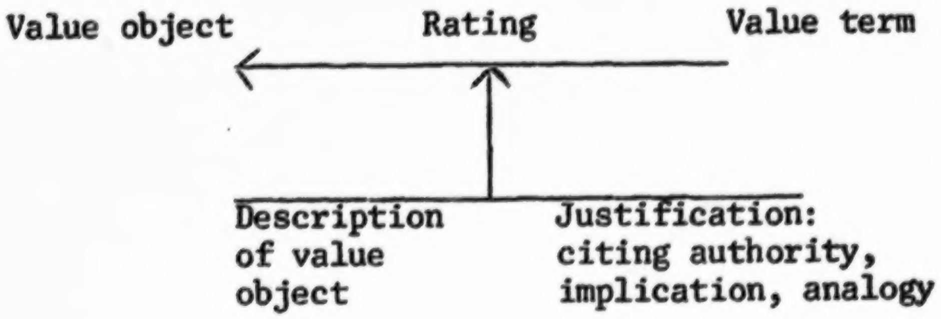
These three variations together with the model provide the basis for categorizing evaluative ventures into four major types.

Type I. Ventures in which the value object is identified, described, and rated, but there is no reference to the criteria, or other justification of the rating. Ventures containing only "identification," "description," and "rating" moves are of this type.



Type II. Ventures in which the value object is identified, described and rated and there is discussion of the criteria of the value term, but no other form of justification of the rating is introduced. Ventures containing at least one move of each of the following kinds: "identification," "description," "rating," "criteria," and do not contain "relational" moves with the exception of "explanation of discordant characteristics," are of this type. This is the model form represented in Figure 4.

Type III. Ventures in which the value object is identified, described, and rated, and some form of justification of the evaluation other than discussion of criteria, is included. Ventures containing "identification," "description," "rating," and "relational" moves (other than "explanation of discordant characteristics" only) are of this type.


Value object
Rating
Value term
Description of value object
Justification: citing authority, implication, analogy

Type IV. Ventures in which the value object is identified, described and rated, and justification of the rating includes both reference to criteria of the value term and to some other form of argument. Ventures which include all types of moves (identification, description, rating, criteria, and relational) are of this type.

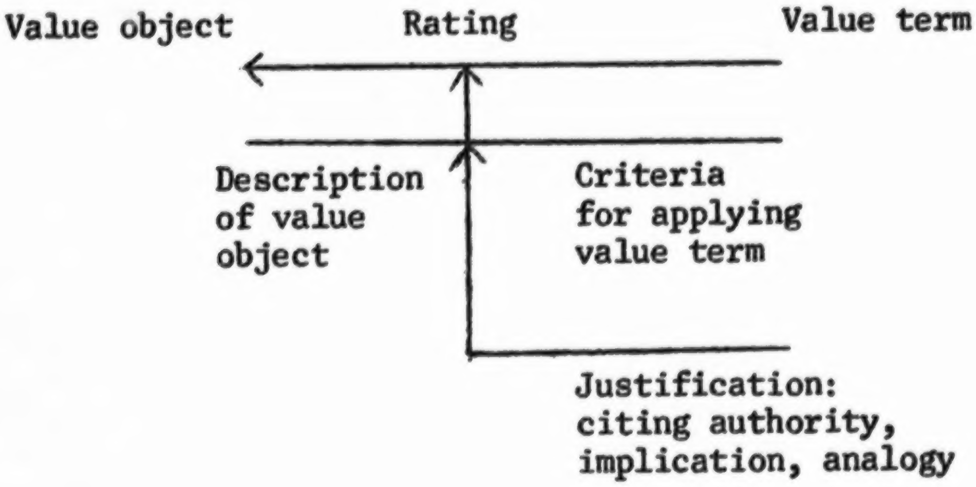

Value object
Rating
Value term
Description of value object
Criteria for applying value term
Justification: citing authority, implication, analogy

Table 12 sets out the frequency with which these different types of ventures occurred among the 37 evaluative ventures which were recorded.

Table 12 Evaluative Ventures: Frequency of Four Types of Ventures

Type of venture	Total Frequency	Frequency of evaluation ventures per ten recorded lessons *				Median number of plays per venture
		Social Studies	English	Science	For all lessons	
I. Description-Rating	12	1.9	4.0	0.5	1.8	3.5
II. Description-Rating-Criteria	12	3.3	1.3	0.5	1.8	7.5
III. Description-Rating-Relational	6	1.1	1.3	0.5	0.9	7.5
IV. Description-Rating-Criteria-Relational	5	0.3	2.0	0.5	0.8	8.0
V. Others	2	0.3	0.7		0.2	4.0
Totals	37	7.0	9.3	2.0	5.5	7.0

---

* The data reported in this section of the table are taken from 27 lesson periods recorded in social studies, 15 lesson periods in English, and 20 lesson periods in science subject-areas. The total for all lessons includes also 5 lesson periods recorded in geometry in which there were no evaluative ventures.

Inspection of Table 12 shows that Type II and Type I respectively are the most frequently occurring ventures in social studies. In English Types I and IV, in that order, occur most frequently. In science all types are equally distributed. When all subject areas are combined, Types I and II are found to occur equally often and about twice as frequently as other types of ventures.

Patterns of Moves

The arrangement of moves in a venture is of considerable interest. On theoretical grounds the sequencing of learning appears to be related to the order of moves. Furthermore, since each move mediates content, the ordering of the content of instruction would seem to be related to the sequence of moves.

While the ventures of a given type may exhibit the same formal structure, the order of occurrence of the component moves may be different. Discussion in evaluative ventures, as already noted, centers in the development and justification of an evaluative assertion or rating. Consequently, the moves which have been identified in the discussions are not primarily information units (as they are in concept ventures), but perform the dual function of providing information and forming the elements in the operations of demonstration and proof. For this reason, the relationships between successive moves in evaluative ventures are likely to be at least partly determined by the logical requirements of justifying an evaluative assertion.

On the other hand, it is not to be assumed that the occurrences of moves in evaluative ventures follow some simple logical pattern. There are wide variations in the point or direction of the discussion in different ventures. In some cases the discussion may be concerned with the justification of a particular evaluative assertion. In other cases, alternative evaluations may be considered, or a search made for some appropriate evaluation. The participation of several speakers with differing points of view is likely to add a further source of variation in the order of moves.

To gain some insight into the sequence of moves we have followed the same procedures as we used in certain other types of ventures; namely, pairing of plays, identifying plays in relation to different parts of ventures, and the construction of flow charts.

By tabulating the consecutive pairs of plays that occur in ventures we were able to determine their frequencies. The results are shown in Table 13.

Table 13. Frequency of Pairs of Plays in Evaluative Ventures

	Second play in a pair								
First play in pair	1. Identif.	2. Descrip. (General)	2.3 Descrip. (Instance)	3. Rating (General)	3.3 Rating (Instance)	4. Criteria	5. Relational	End of venture	Total frequency of plays
1. Identification		17	2	23	2	2	3		49
2. Description (General)	6		4	29	6	5	8	12	70
2.3 Description (Instance)	1	1		1	4	4		2	13
3. Rating (General)	2	35	2		1	11	7	6	64
3.3 Rating (Instance)		4	1	6		1	1	4	17
4. Criteria	1	8	3	1	4		1	9	27
5. Relational	2	5	1	4		3		4	19
Total	12	70	13	64	17	27	20	37	259

The pair of plays that occurred most frequently is 3 and 2--Rating (general)--Description (general). This pair occurred 35 times. Next in frequency of occurrence is 2 and 3 which occurred 29 times. In other words, description (general) and rating (general) occur together 64 times out of a total of 222 occurrences of pairs of plays. The identification--rating (general) pair and the identification--description (general) pair are the next in frequency of occurrence and in that order. Of the total number of pairs of plays, 57.7 percent contain a descriptive (general) play, 54.9 percent a rating (general) play, 19.8 percent a criterial play, and 16.2 percent a relational play.

A different kind of information about the occurrence of plays in ventures can be obtained by analyzing the position in the venture at which a play occurs. If we treat each venture as a unit of discourse, we can divide it into quarters. We can then note the frequency of plays occurring in each quarter of the ventures. The distribution of plays by position in ventures is shown in Table 14.

Table 14. Evaluative Ventures: Frequency of Plays by Position in Venture

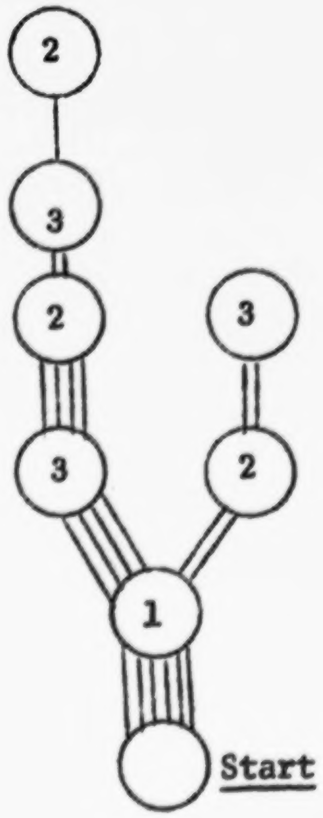
Type of play	Position in Venture				
	First quarter	Second quarter	Third quarter	Fourth quarter	Total
1. Identification	36	7	4	2	49
2. Description (General)	11	19	19	21	70
2.3 Description (Instance)	2	5	3	3	13
3. Rating (General)	15	16	17	16	64
3.3 Rating (Instance)		4	6	7	17
4. Criteria	1	7	9	10	27
5. Relational		6	7	6	19
	65	64	65	65	259

Identification plays occur mainly in the first quarter, as can be seen from inspection of Table 14. Approximately 73 percent of these plays appear in the first quarter and there is a tendency for them to occur with decreasing frequency toward the end of ventures. This distribution is compatible with what we would expect on the basis of common sense, for it seems reasonable that teachers and pupils would tend to mention the object with which they are concerned before attempting to evaluate it. On the other hand, relational plays do not occur at all in the first quarter, and with the exception of a single case no criterial plays are to be found in this quarter. This finding is not surprising since relational plays tend to function as evidence for or against a given rating and would hence tend to occur after the object and its evaluation were given. By the same token, criterial plays would tend to be made after the value object had been stated and a rating of it given. The rating (general) plays are about equally distributed from quarter to quarter, and somewhat the same situation obtains for descriptive plays. On the basis of the internal logic of ventures there is no reason to suppose that these plays would be otherwise distributed.

The order with which the plays in evaluative ventures occurred was investigated by constructing composite flow charts of the sequence of moves in all the ventures with the same kind of structure. Figure 5 illustrates the nature of these flow charts. It is evident from these charts that the most common sequence, which appears to form the core of an evaluative venture, is an alternating sequence of "description" and "rating" moves. This interpretation is supported by an analysis of pair sequences of moves. Over all ventures, the most common pairs of moves are the "description-rating," and the "rating-description" sequences. (They constitute 33 percent of all pair-sequences.)

Figure 5. Sequences of Plays in Evaluative Ventures

Type I ventures. The chart includes all sequences in the 12 ventures which occurred more than once. Each solid line represents a sequence occurring twice. 20.4% of the sequences have been omitted because they occurred in only one venture.



B. Type II ventures. The chart includes all sequences in the 12 ventures which occurred more than once. Each solid line represents a sequence occurring twice. 37.5% of the sequences have been omitted because they occurred in only one venture.

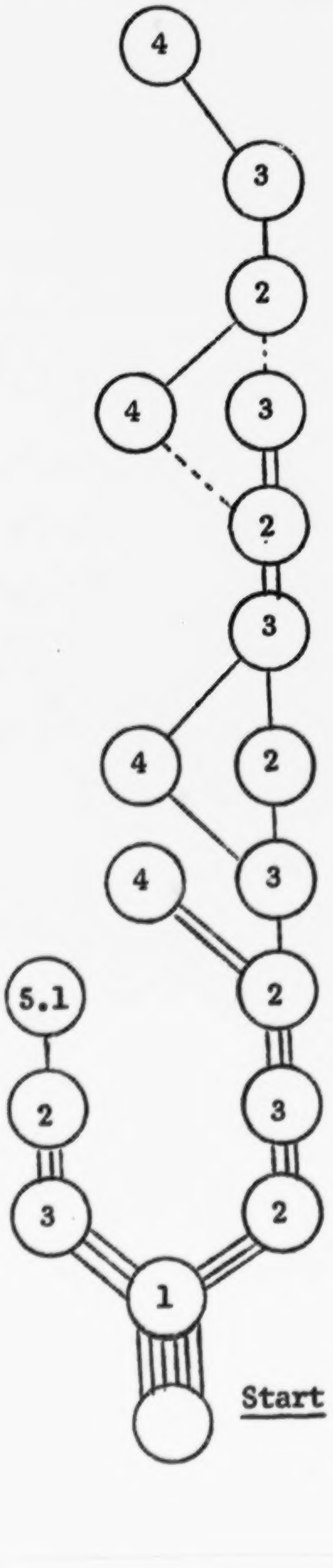
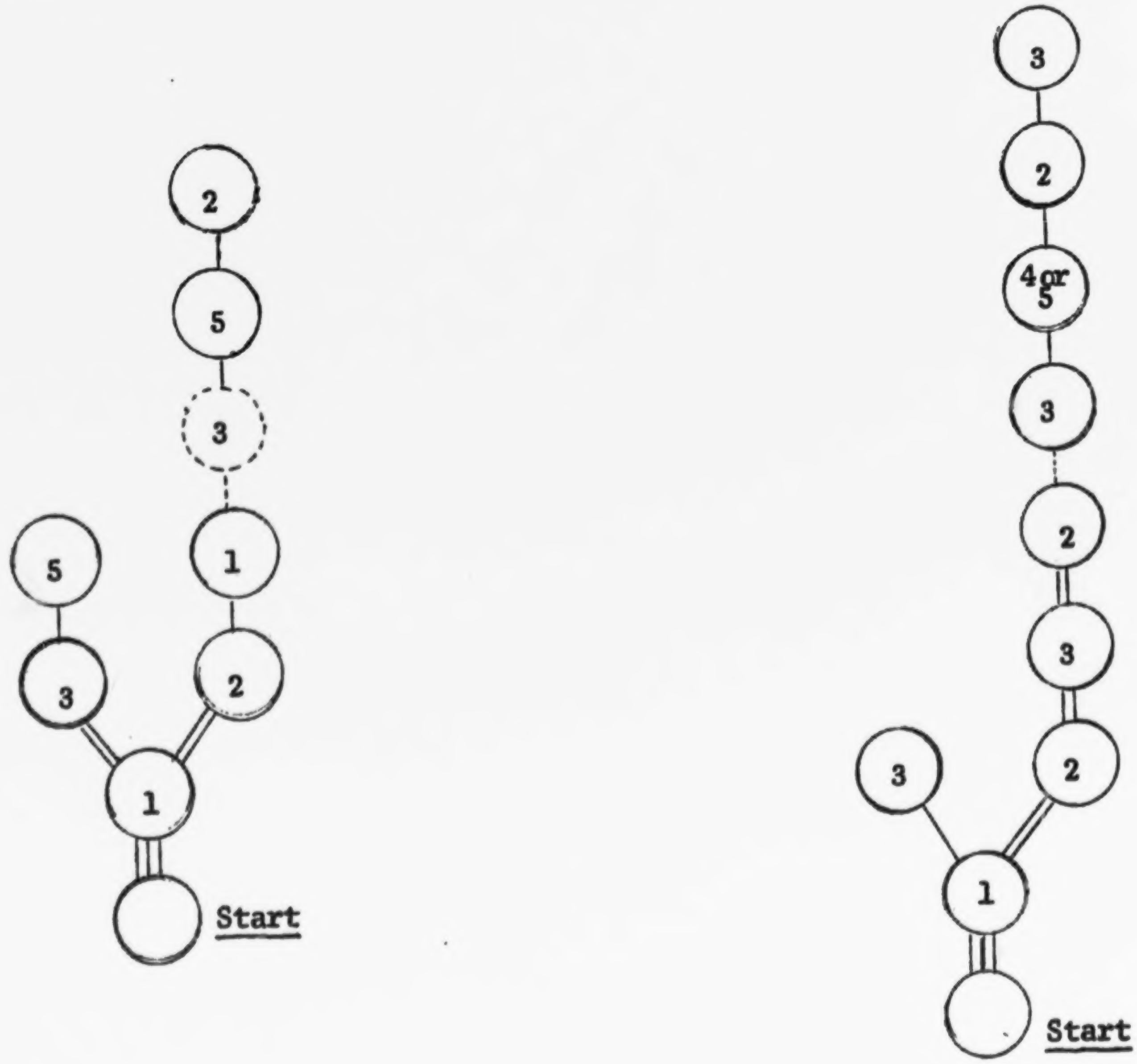


Figure 6. Sequences of Plays in Evaluative Ventures

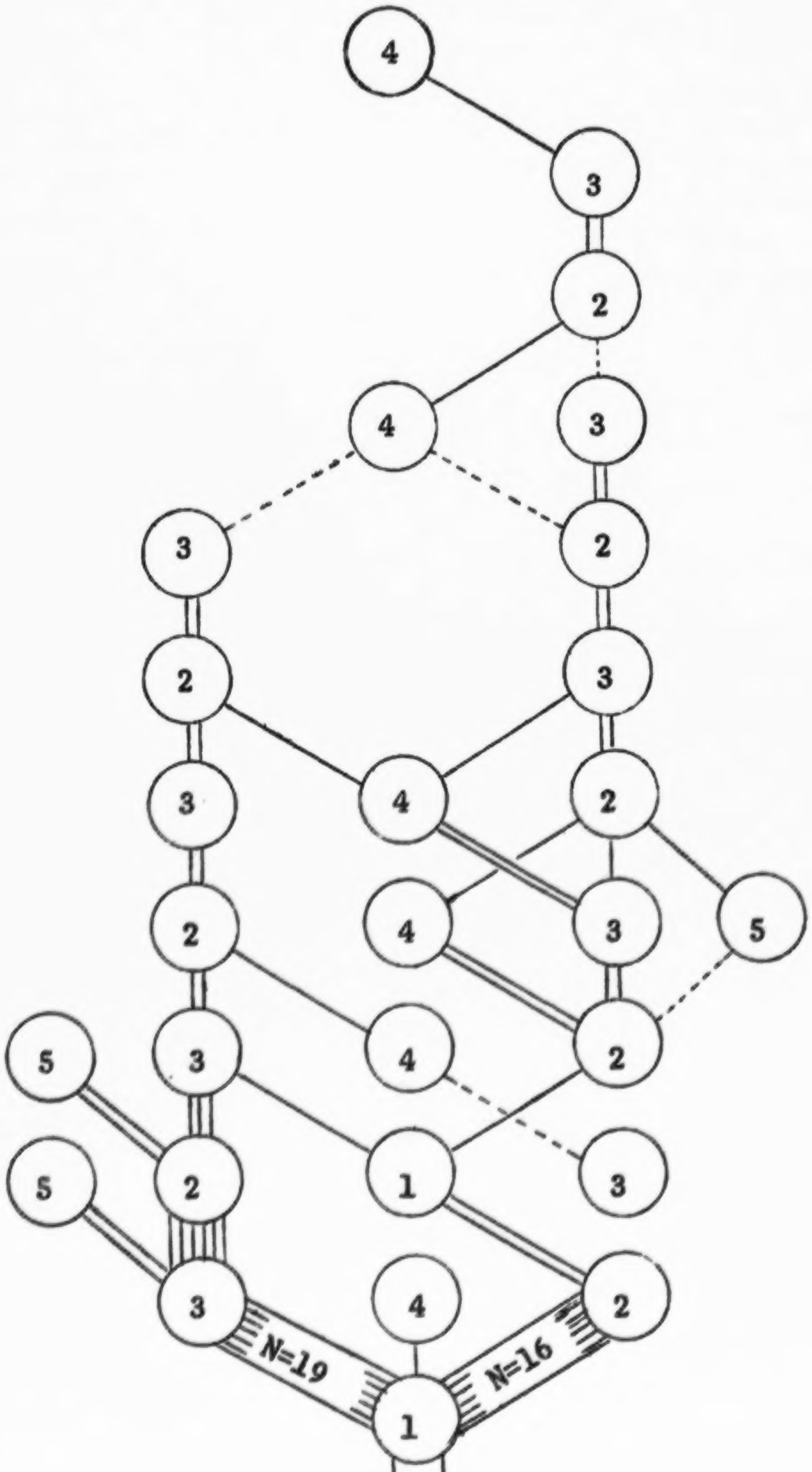


A. Type III ventures. The chart includes all sequences occurring more than once in the six ventures. Each solid line represents a sequence which occurred twice. 56.1% of the sequences have been omitted because they occurred in only one venture.

B. Type IV ventures. The chart includes all sequences occurring more than once in the five ventures. Each solid line represents a sequence which occurred twice. 60.4% of the sequences have been omitted because they occurred in only one venture.

Figure 7. Sequences of Plays in Evaluative Ventures -- All Ventures

Note: This chart includes all sequences of plays which occurred more than once in the 37 recorded evaluative ventures. Each solid line represents a sequence which occurred twice. The broken lines represent sequences which occurred in only one venture, but are needed in the chart to show continuity. 30.95% of the sequences have been omitted.



Chapter X

ANALYSIS OF INTERPRETATIVE VENTURES

Interpretation is a type of comprehension. To interpret is to tell what a communication or a set of symbols means; to have the meaning is to have an interpretation. The form of communication comprising our sample of interpretative ventures is primarily literature. Of a total of 59 ventures that make up the sample, 54 are on the subject of English, one on social studies, and four on core programs. Most of the 54 ventures in English are about literature.

It is difficult to tell from transcriptions of a sample of lessons whether or not either the plot or theme of a piece of literature has been brought out and analyzed somewhere in the series of lessons. This is so because one is as unlikely as not to begin taping classroom discussion at a point where the plot is discussed, if indeed it is discussed at all. For the same reason, it is difficult to know whether or not the setting of the story is understood in its entirety. So, in analyzing interpretative ventures, the analyst must take a great deal for granted with respect to the general context within which each venture is approached and understood by the class.

The moves we have observed indicate that a wide range of meanings is to be found in classroom discourse. In general, interpretation ranges from very narrow and specific meanings of words, phrases, and other simple expressions to larger passages and from there to the significance of a large part if not the whole of a work. The approaches to the interpretation also vary in classroom discussion. One will find questions as to the author's reasons for writing the particular work as well as for the author's reasons for writing something in a particular way. The author's motive or reason for writing the passage is sometimes discussed as well as his reasons for introducing a particular character or for his use of a particular situation. In a strict sense, these sorts of considerations fall outside of what is ordinarily meant by interpretation. The author's motives may not necessarily be related to the work under discussion. But we have not followed this strict meaning of interpretation and have included in our analysis materials from classroom discourse that have to do with the motives and techniques of the author.

Class discussion of the material to be interpreted usually involves claims about the course of human events, about the conditions that influence these events, and so forth. Inferences are made by both teacher and student about the various characters and their actions and, in some cases, how one should feel about people in such and such circumstances. The discussion in an interpretative venture is concerned primarily with information about events and characters. Ordinarily, the beginning of a venture contains some questions about an event or a character, or else it consists in a quoted passage from the work being discussed. These represent kickoff points from which the discussion proceeds. The remainder of the venture ordinarily explores the meaning of the passage or an interpretation of the action of a character or the assessment of some situation, character, or action, or any mixture of these. Sometimes the venture is relatively long and will consist in a number of quoted passages which are discussed in sequence but are related to some central point of significance. In other cases, the venture may be fairly short, depending upon whether the interpretation is concerned primarily with the literal or structural meaning of a passage or with the significance of a more extended portion of the work.

Kinds of Information in Interpretative Ventures

On first impression it may seem strange to talk about information being involved in interpretation. But a bit of reflection will show that interpretation is one way of extracting information from a set of symbols. To understand an interpretative venture is to understand something of the kinds of information which it contains. So in our analysis of these ventures we attempted to list the kinds of information that constitute their content. This list is as follows:

1. Meaning of an expression taken literally.
2. Meaning of a metaphor.
3. Symbolic meaning of an object, event, person, and so forth.
4. Significance of a literary work taken as a whole.
5. Qualities attributed to a person, event, action, and so forth.
6. Reasons for, or causes of, events, actions, feelings, and so forth.
7. The effects of a literary work upon the reader or listener.
8. Factual descriptions of what took place in an account.
9. Evidence for or against a particular inference or judgment.
10. Motives of an author.
11. A passage from the work itself.
12. Literary forms and devices and their uses.

Of course, this list does not include all that is to be found in the interpretation of a work. But it does represent the kinds of information identified in the classroom discussion constituting the ventures under analysis.

Identification and Analysis of Interpretative Moves

As indicated in earlier chapters, one of the ways of analyzing teaching behavior is to ascertain the sorts of verbal moves made by teachers and students as they deal with the content of instruction. In our analysis of interpretative ventures we have found ten kinds of moves made by either the teacher or student, or both, as follows:

1. Texture meaning
2. Instrumental meaning
3. Symbolic meaning
4. Structure meaning
5. Extrapolation
6. Factual elucidation
7. Citation
8. Representation
9. Evidential moves
10. Meta moves

These ten moves may be classified into five major types. The first four are explicative moves and the fifth is a class to itself and consists of a number of subtypes (see appendix). Numbers 6, 7, and 8 are informative moves. Moves 9 and 10, like 5, each comprise a class of its own.

Explication moves are those which mediate the significance of the text material under consideration. Extrapolation moves go on beyond the meaning of the text material to inferences about persons, events, actions, etc., for which evidence in the text is insufficient. Moves of the informative type give or mention a passage from the text for consideration, or they set forth what took place in a passage. Evidential moves give support to the claim, or tend to deny the claim, that the meanings and inferences mediated by moves of types 1 to 5 inclusive are correct. Meta moves deal with the literary forms and devices used by the author.

The following discussion of the moves in interpretative ventures provides examples of each type of move. We shall begin with the four types of explication moves.

Texture meaning moves. This move is an important part of interpretative ventures as a clear understanding of the literal meaning is made up of three subtypes. The first involves the meaning of an expression regarded literally, as seen in the following example.

Example 1

T: Are sentiment and love synonymous terms? Do they say the same thing?
S: No.
T: Well, what's the difference in sentiment and love?
S: Maybe one's stronger.
T: One's stronger.
S: Which one?
T: All right, we feel there's a difference between sentiment and love, don't we?
S: I think they're both kind of made out of the same material.
T: They're both a kind of sympathy or an understanding and a positive feeling toward. They're both emotions. Love may be more encompassing than sentiment. Sentiment may be just the feeling, whereas--I don't know--
S: What is it? What's sentiment?
T: Sentiment means sympathy, doesn't it? But--this love is a kind of sentiment too. Maybe love is a broader term than sentiment.

This move attempts to clear up the meaning of "love" and "sentiment" by disentangling them. There are many variations of this move. Thus, instead of asking for the differences in the meanings of these terms, the teacher might simply have asked for the meaning of "sentiment" which was his primary concern anyway.

The second type of texture move mediates the significances of a metaphorical expression or passage. The task is to point out the referent and the relation of the referent to the expression. An illustration of this is found in a discussion of a passage in Cry the Beloved Country where reference is made to an impending storm.

Example 2

T: What is the greatest storm that's gathering? What is the lightning and thunder that's going to bring death and destruction? What is that? What is the metaphor here?
S: The racial problem.
T: The racial strife that's coming, yes. The greatest climax of this matter's coming.

Here the referent of lightning, thunder, and storm is pointed out, namely, the racial conflict. While one might say this move may contain some assumption of extrapolation, there is a sense of literal meaning involved in interpreting the metaphor, as the referent contains elements similar to the metaphor, the metaphor being in a sense a hieroglyphic, though coined by the author (or character) himself rather than being in general usage.

The third sub-move is paraphrasing a passage from a reference work. Here a passage is rephrased, with the addition of literal meaning and sometimes extrapolation. It is an attempt to get at the meaning of a passage.

Example 3

T: All right. Now, what does that [what was said in a passage] prove--what he said? What does that prove?
S: Well, it shows how the black man is getting cheated and the white man is getting rich out of using the black labor.

In the passage being discussed, the speaker says the black man should get his share of the gold that is being mined with black labor. Obviously, the passage is rephrased and in so doing there is some attempt by the student to read in his understanding of the meaning.

Instrumental meaning moves. This is similar in intent to a texture move in that an attempt is made to widen the student's vocabulary. However, in this sort of move, expressions--words, phrases, etc.--not appearing in the referent material are defined to facilitate further study. The following is an example where "hunchback," the word from the material being discussed in class, is referred to as a symbol. The term "symbol" does not appear in the text material but it is used in exploring the significance of the hunched figure.

Example 4

T: But what does the word "symbol" mean?
S: To stand for.
T: To stand for.

This move is used as an aid to the student's understanding of the class discussion, by bringing out the meaning of the term "symbol."

Symbolic meaning moves. When a condition or event is taken to represent or mean some other condition or event, the former is said to be a symbol of the latter. A symbolic meaning move is one which mentions or describes the condition or event that is taken to represent something of significance in the textual discourse. Partly because the symbolism is typically established in the text itself and is often not in the reader's repertoire, symbolic meaning moves are important in interpretative ventures. An example of such a move is the following:

Example 5

T: And what is it, exactly, that the bull voice is representing in respect to solving the problems of South Africa?
S: Black supremacy.

This move emphasized the "bull voice" of one of the characters in the story as a symbol of the doctrine of black supremacy as a resolution of the racial conflict.

Structure meaning moves. This sort of move attempts to get at the meanings which may be either literal or imaginative, that arise from, or are a function of, the text as a whole or at least in large part. This move thus may be considered to include the theme and the message. However, it is often more general than the theme or the message itself. An example is the following:

Example 6

T: There were several indications, throughout this story, that this was a war-time story. That was, one, he was so eager to join. What else indicated that this was a war-time story?
S: Sugar was rationed.
T: Yes. That was one thing that would tell you.

Here the implication is of the importance or significance of events peculiar to or connected with war-time rather than simply an inference as to the time of the events. While this move alone does not set forth specifically the story's theme, it does give the general context within which the theme may be inferred as the class discussion progresses.

Another example is the following:

Example 7

T: In this book, by showing us the contrast between son and father and about the Jarvis family, naturally two are the Jarvis family, what is Alan Paton trying to show us?
S: Is he showing that minds are being changed by the change in conditions and that the younger generation is striving more toward a peaceful solution to the problem than one of either race's supremacy?
T: Yes, at least the younger people are beginning to question their parents' point of view and sometimes to disagree with their parents' point of view.

This move is concerned with a meaning drawn from the book as a whole as well as the author's intent rather than with the facts of the story.

Extrapolation moves. These moves attempt to elicit judgments about characters, events, actions, etc., or opinions as to the causes of, or reasons for, events and actions given in the text. These excursions into the realm of inference give the student an opportunity to bring his own norms of judgment into play as he gains deeper insight into the commonsense explanations and justifications of human conduct.

The following is an example of an extrapolation move where a judgment is made about a person:

Example 8

T: Now, Scobie is actually talking against truth here. Does this seem typical? Is he the sort of person who sees what nobody else sees in his daily living?
S: No.

The judgment is made that Scobie is not more observant than others.

The following is an example where a judgment is made as to the reason for a feeling or preference:

Example 9

T: And why does he want Yusef out?
S: Well, he wants Tallit, he wants him there because he's a Catholic, isn't he?
T: Right!
S: And Yusef is a --
T: Not Catholic.
S: Uh--
S: Mohammedan.
T: Mohammedan. Right!
S: And he'd rather do business with Tallit. He'd rather have a Catholic there.

The inference is made that he prefers to do business with Tallit because Tallit is a Catholic.

Factual elucidation move. This move involves citing the facts as to what took place, etc., in a passage, giving the content without quoting the material or paraphrasing it. This move is seldom important in itself. Rather it often places before the class basic material, often background, for the discussion that occurs in an extrapolation move. The factual elucidation move may also be used for the purpose of review as well as to help identify the subject of discussion. The following is an example of this sort of move:

Example 10

T: Who is Yusef? What do you have?
S: A rich merchant.
T: A rich merchant. Can you say more about him?
S: He is a Syrian.
T: He is a Syrian.
S: And Scobie picked him up when his car broke down and gave him a ride.
T: All right.

As can be readily seen, some basic facts of the story are given.

Citation moves. The actual quotation or reference to an appropriate part of the text serves the purpose of giving the exact material for discussion. The passage may be quoted essentially as it appears or it may be explicitly indicated either by name or by location in the text. The following is an example.

Example 11

> T: He says, "Tallit is a small man. He is a Christian. Father Rank and other people go to his house. They say, 'If there's such a thing as an honest Syrian, then Tallit is the man.' Tallit's not very successful, and that looks just the same as honesty."

This utterance is a direct quotation from the text material.

The following is an example of a passage indicated by location in the text.

Example 12

> T: Well, were there any passages in here that you don't like or think were remarkable in this story up to now? How about on the bottom of 58?

The location of the material to be discussed is explicitly given as the bottom of page 58.

Representation moves. This move involves citing a person as speaking or acting for a group or a point of view. It is similar in content to both citation and factual elucidation moves. Representation is intended to present a person in a real sense rather than symbolically.

Example 13

> T: But you do agree, do you, that Arthur Jarvis, who was slain by Absalom, is a proponent of the way of love or peaceful coexistence between the races?

Here Jarvis is cited as standing for peaceful coexistence.

Evidential moves. In this move, evidence for or against a judgment, a particular meaning claimed for an expression or passage, etc., is given. It is a natural step in the process of interpretation and in the process of classroom teaching. It tends to fix and verify in the mind of the individual the interpretation and to bring agreement among the students as to the interpretation. Two cases of evidential moves occur: (1) when fact is related to, explains, or supports judgment, and (2) when judgment is related to, explains, or supports judgment.

The following are examples of evidential moves:

Example 14

T: How do you know this? Is it ever said? Is it ever said that this is in a coastal colony?
S: We know because there's a ship coming in and . . .
T: Very good. We know because the ships come in and out and the big problem there is how to inspect the ships. Is that right?

The fact that ships come in is cited to support the judgment that it is a coastal colony.

The following example shows how judgment can support judgment. In the move that precedes this one the constable is cited as a proponent of peaceful coexistence.

Example 15

S: Because he [constable] is trying to reform the black criminals into, trying to turn them into, citizens that will strive and try to achieve for good and for better things in Johannesburg or where they want to work.

Here somewhat judgmental evidence that the constable is trying to make the black criminals into useful citizens is used to support the judgment that he is a proponent of peaceful coexistence between the races.

Meta moves. This type of move has two subclasses. The first one notes devices, e.g., vignettes, used in a literary work to produce certain effects on the reader or listener. These moves may not be of particular importance in the process of interpretation. The following is an example of this move, in which the use of the device of metaphorical language is noted.

Example 16

T: By the way, what kind of language is that that I just read?
S: Metaphorical.
T: Metaphorical language. Yes, it is.

The second subtype involves the form of the literary work. The following is an example of this submove.

Example 17

T: I would say that it's a novel. It's a novel--
S: Yeah. It's a novel.

The idea of form involves some feature of the structure of a work which will distinguish it from the structure of another kind of work. Thus, in this case, the work is identified as having the form of a novel..

The Sequence of Plays

Analysis of Pairs of Plays. Discussion in interpretative ventures centers in the derivation of meaning and inference from the text. The moves consequently are informative and inferential. The logical requirements and possibilities of the derivation of meaning and inference from the material in the classroom probably are important in shaping the order of successive moves.

There are, moreover, wide variations in the logical influence upon the order of plays. Thus, in some cases the discussion involving extrapolation may return to a discussion of literal meaning in order to aid the discussion while in other cases the discussion may proceed by giving evidence for the extrapolation. Furthermore, the sequencing of plays will probably be influenced by pedagogical considerations such as student capability and background.

In order to gain insight into the sequence of moves the pairing of plays is investigated. Table 15 shows the frequencies of occurrence in the ventures of pairs of consecutive plays. The pair of plays observed most frequently is the 7-5 sequence, occurring 40 times. Next in frequency is the 6-5 pair which occurred 30 times. Thus the pairing of the citation-extrapolation and factual elucidation-extrapolation plays occurred 70 times out of a total of 243 occurrences of pairs, or 28.8 percent of the total pairs. The extrapolation-factual elucidation sequence occurred 19 times and, together with the extrapolation-citation sequence, make up 14 percent of all pairs combined. The texture meaning-extrapolation sequence occurred 12 times, or about 6 percent. The extrapolation-evidence pair occurred 11 times, or about 5 percent. The citation-texture meaning sequence was observed 19 times, or about 8 percent of the total of 243 pairs.

Of the total number of pairs of plays, 63.8 percent contain an extrapolation play, 41.2 percent contain a citation play, 29.6 percent contain a factual elucidation play, 25.9 percent contain a texture meaning play, and 14.4 percent contain an evidence play. It seems clear that most interpretative discourse involves immediate extrapolation from given information from the text, either cited or given in class.

Table 15

Frequency of Pairs of Plays in Interpretative Ventures

Second Play in a Pair

First Play in a Pair	1. Texture Meaning	2. Instrumental Meaning	3. Symbolic Meaning	4. Structure Meaning	5. Extrapolation	6. Factual Elucidation	7. Citation	8. Representation	9. Evidence	10. Forms and Devices	End of Venture	Total Frequency of Plays	Total Pairs
1. Texture Meaning		1	0	0	12	2	7	0	2	4	7	35	28
2. Instrumental Meaning	0		1	0	0	0	0	0	0	1	0	2	2
3. Symbolic Meaning	0	0		0	2	0	1	0	1	0	1	5	4
4. Structure Meaning	2	0	0		2	0	1	0	1	0	5	11	6
5. Extrapolation	9	1	2	2		19	15	0	11	2	33	94	61
6. Factual Elucidation	1	0	1	1	30		4	2	0	0	7	46	39
7. Citation	19	0	1	5	40	3		1	0	3	1	73	72
8. Representation	0	0	0	0	0	2	0		4	0	0	6	6
9. Evidence	3	0	0	0	4	5	0	3		0	5	20	15
10. Forms and Devices	1	0	0	2	4	2	0	0	1		0	10	10
Total Pairs	35	2	5	10	94	33	28	6	20	10	59	302	243

The Position of Plays in Ventures. The number of plays in each quarter of the venture was tabulated. The basis of the tabulation was the assumption that the plays were of equal length. Thus, in dividing a venture into quarters, fractions of plays occurred in the quarters. The results of this tabulation for all interpretative ventures are given in Table 16. Play number 5 tended to occur in the last half with about double the frequency that it occurred in the first half. Play number 7 tended to occur in the first quarter with more than double the frequency of the second quarter, and over three times more often in the first half than in the second half. Play number 9 occurred in the last three quarters about equally, but with less frequency in the first quarter. The other types of plays were more or less equally distributed among quarters, though play number 10 occurred mainly in the middle quarters.

In summary, the picture seems to be that the plays are definitely unevenly distributed in the ventures, this distribution tending to form an over-all pattern. The main features of this pattern are that play number 7 occurs mainly in the first quarter, tapering off rather rapidly in the other three quarters, and followed by play number 5 which occurs mostly in the last two quarters. This pattern seems reasonable since play number 5 is composed of extrapolation moves and such moves must have something from which to extrapolate before they can occur. Play number 7 affords the "something" necessary for extrapolation and hence comes toward the beginning of ventures.

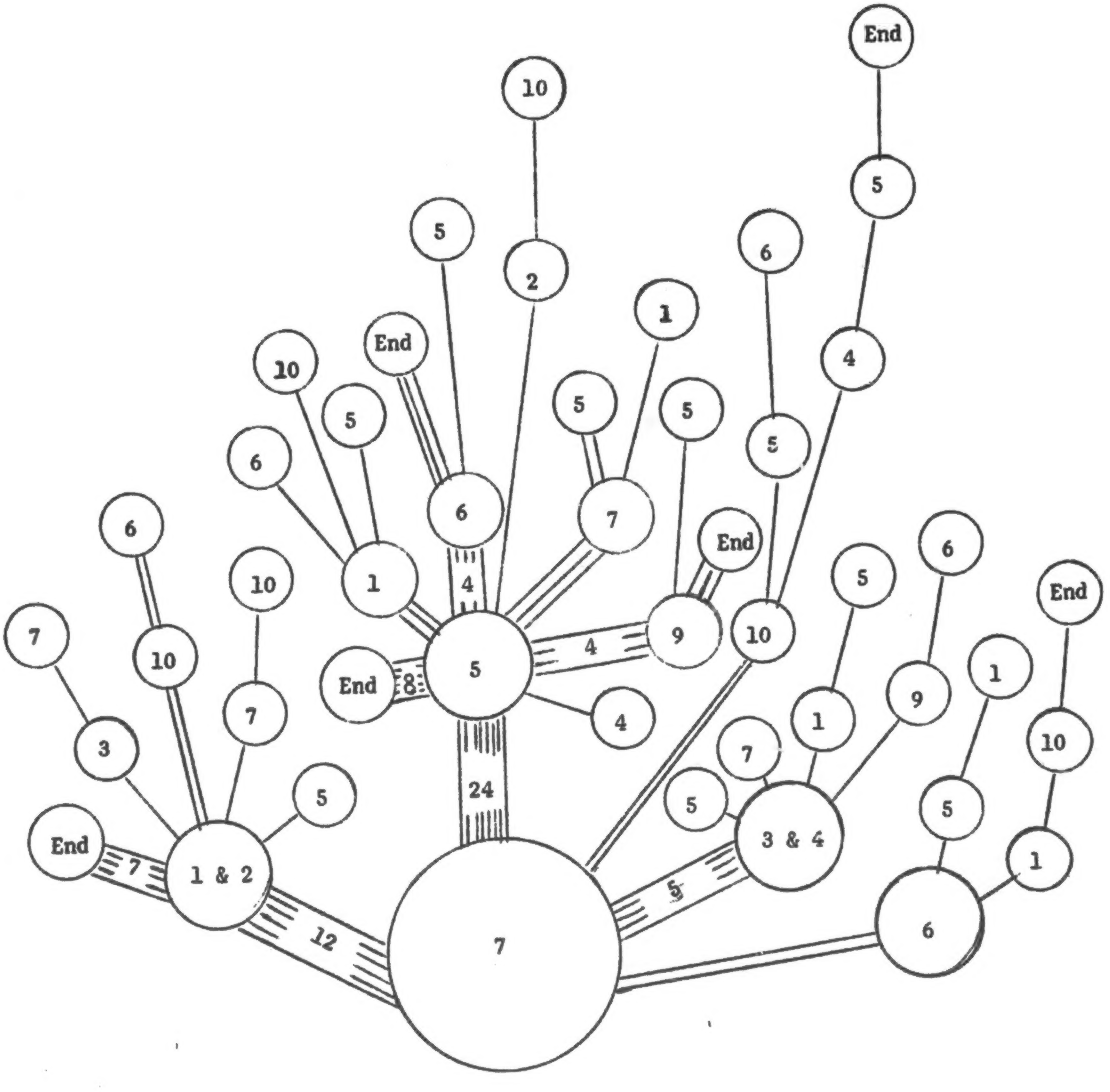
Table 16

Distribution of Interpretative Plays by Quarters

Plays	Total Number	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Texture Meaning	35	5	9	10.75	10.25
2. Instrumental Meaning	2	1	.50	.50	0
3. Symbolic Meaning	5	1	.50	2.50	1
4. Structure Meaning	11	2	2.50	2.25	4.25
5. Extrapolation	94	10	25.50	24.75	33.75
6. Factual Elucidation	46	11.75	10.75	11.75	11.75
7. Citation	73	40	17.50	8.25	7.25
8. Representation	6	2	1	2	1
9. Evidence	20	2	5	7.25	5.75
10. Forms and Devices	10	.75	3.25	5.50	.50

Patterns of Plays in Ventures. What has been said in the preceding paragraphs can be shown in flow charts. Two charts were drawn, one beginning with a number 7 play and the other with a number 6 play. The charts include only the first four plays since twenty-seven or nearly half of the fifty-nine ventures end with the second or third play and the remaining plays tend to consist of different sequences of plays 7, 5, 1, and 6. These charts give a good picture of the order of plays in the ventures, particularly the early branching. It is seen that the mainstream of the ventures beginning with a number 7 play is to a number 5 play followed about equally by a 7, 6, 1, or 9 play. Eight ventures consist in a 7-5 sequence alone. A secondary stream, beginning with a 7, is to a 1 or a 2 play with seven plays terminating there and five others distributed among 3, 5, 7, and 10 about equally. The ventures beginning with a 6 show a second play of 5, except for one case, followed by a 6, a 7, a 9, or a 3 in those that do not end. The absence of a 6-1 or 2 sequence is interesting.

A bar graph of the flow chart shown in Figure 10 for the total number of ventures was made as another attempt at showing the relative proportions in branching. It is seen that a structure based on the logical nature of the plays is clearly evident, with a 7-5-9 sequence or a 7-5-6 or 7 sequence being common and also a common use of the 7-1 or 2 sequence. Note that such a combination as the 7-9 sequence does not occur.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8
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4
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1
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3
7
10
24
5
7
5
End
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6

Figure 8. Flow Chart of First Four Plays of Interpretative Ventures Beginning With Move 7

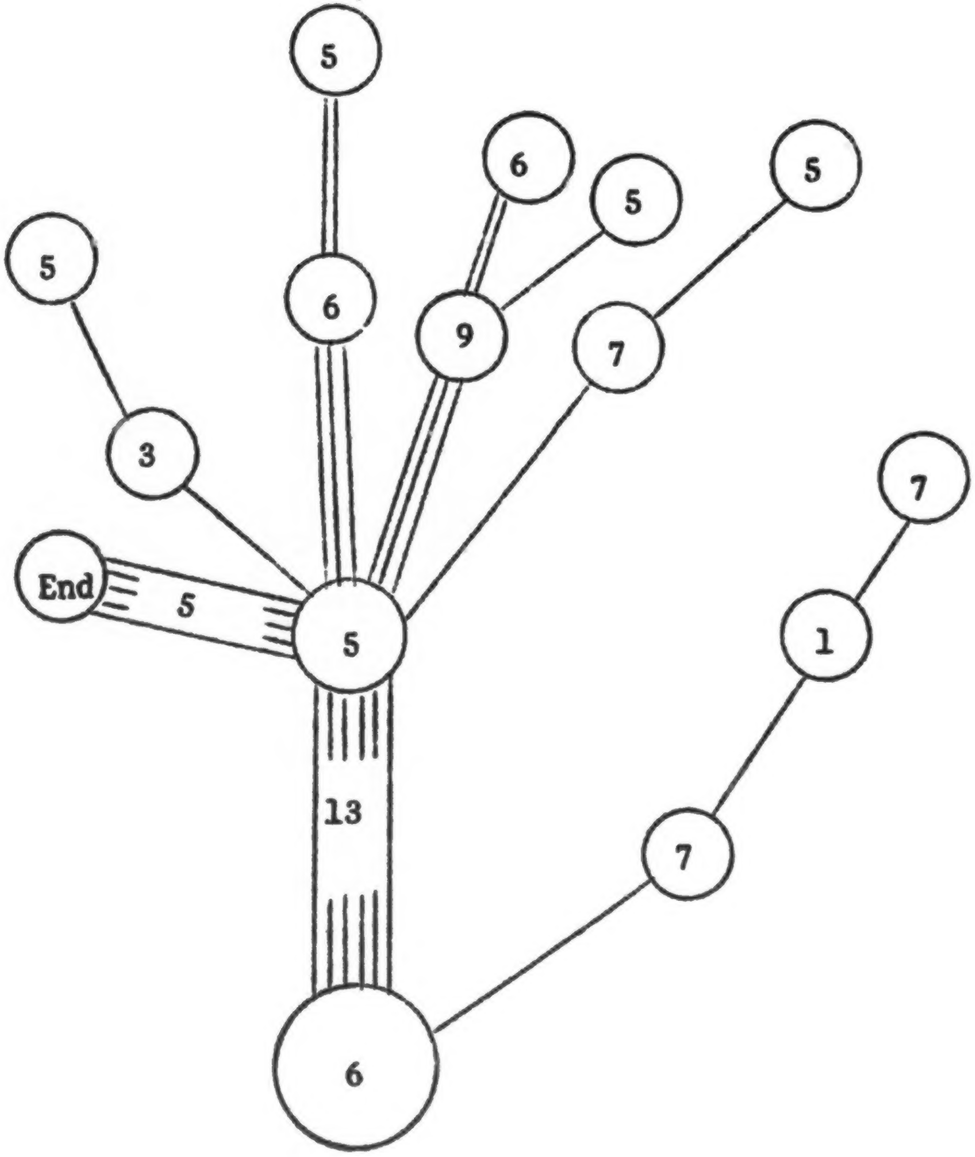
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Figure 9. Flow Chart of First Four Plays of Interpretative Ventures Beginning With Move 6

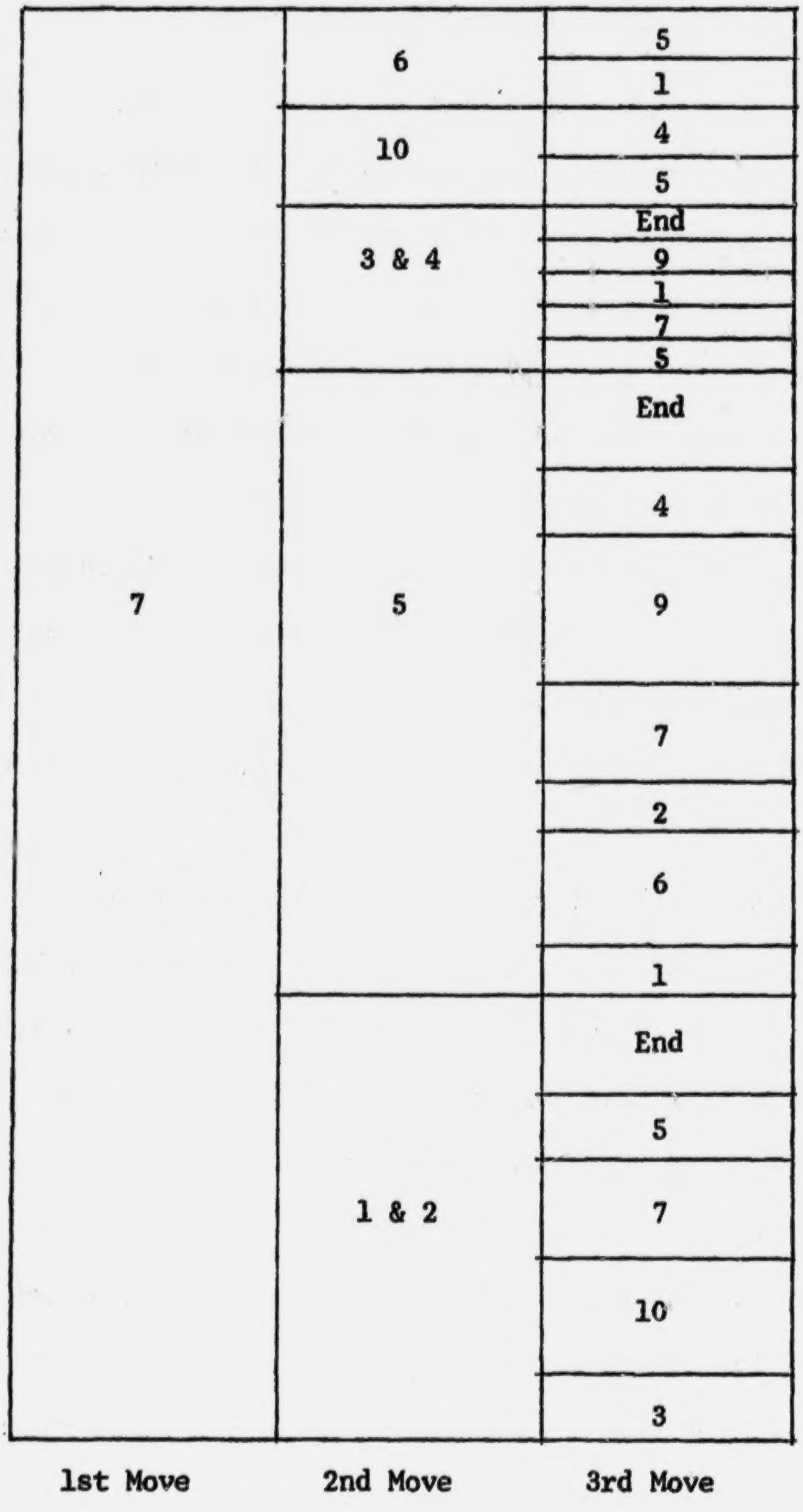

Figure 10. Bar Graph of First Three Plays in Those Interpretative Ventures Beginning With Move 7.

4

Chapter XI

ANALYSIS OF RULE VENTURES

This type of venture deals with a rule or a number of related rules. The term 'rule,' as used here, refers to conventional ways of doing things or to analytic relationships which may be used to guide actions. Rules are often referred to by other terms. They may be called principles, postulates, axioms, conventions, norms, morals or even definitions.

Rules that have never been written down may still be followed. Before the days of Emily Post many of the rules of etiquette may have been of this sort. However, the rules that are of interest in this chapter are those that have been formulated or that are formulated in the course of a lesson. A rule can, therefore, be thought of as a statement that expresses either a conventional way of doing things or an analytic relationship that can be used to govern actions.

Laws or other explicitly formulated rules are sometimes opposed to conventions. However, the term 'rule' is used in a wider sense here, including conventions in its scope. Conventional ways of doing things, which the formulation of a rule makes explicit, are exemplified by the rules of grammar, the laws of a state, the rules of a game, or the regulations of a school.

In this chapter the role of a rule as a guide to action is given considerable emphasis. The rules dealt with in English and mathematics ventures clearly have this function for the pupils. However, the rules discussed in the sociology ventures bear a more oblique relationship to the behavior of pupils. But, as a discussion of the laws concerning prisoners can be thought to have a general relationship to the moral behavior of the pupils studying these laws, these rules are not treated as essentially different from the rules dealt with in English or mathematics lessons.

The class of actions or decisions that a rule can govern is the range or scope of the rule. Rules differ considerably in their scope. Contrast the following two rules: use 'a' before a consonant or a consonantal 'h,' but 'an' before a vowel or an 'h' that acts as a vowel; do not steal. The range of the first rule is small; that of the second rule is greater. Although the range of a rule is often implied by its formulation and the context in which it is given, an explicit statement of the range serves to sharpen the definition of the rule. Consider the rule, 'Use no figurative language.' The range of this rule is not explicitly given. Yet there are some acts of writing or speaking to which it is applicable and others to which it is not. It is reasonable to expect this rule to be followed in the writing of chemistry reports, but it is not reasonable to expect it to be followed when poetry or fiction is being written. In cases such as this, where restrictions on the range of application of the rule are left unexpressed, the context will normally provide the learner with appropriate clues. Thus the less complete is the statement of the range of a rule, the greater is the reliance upon the context.

The content of the rule determines either the action or the decision when the rule is used in particular cases. The formulation of the rule is thus distinct from the application of the rule where it is used to guide actions or decisions. If the rule is to be applied, the meaning of the rule must be clear, and the meaning of the constituent terms in the rule must be known. Vagueness and ambiguity in the formulation of the rule can lead to error, as can ignorance or misunderstanding on the part of the student. Proper application of the rule to particular cases depends upon knowledge of the rule's content that can be translated into behavior.

In applying a rule to a particular case, it is possible to show that the case does, in fact, fall within the scope of the rule, and this demonstration constitutes a justification of the use of the rule. Although rules are not reports of empirical investigations, it is possible to attempt to justify the rule itself. Because rules differ greatly in their range and content, variations in techniques of justifying them occur. In attempting to justify a theorem of geometry, one would normally show that the theorem follows from other proved theorems or from the axioms and definitions of the system. In justifying a social rule, one might attempt to show that it is beneficial. In justifying a law, one might produce a copy of the relevant statutes or an argument to show that the law is, in fact, a just law. In justifying a prescription of language, one might refer to an accepted grammar or dictionary, or to a person regarded as an authority on correct usage (e.g., a teacher of English). It will be seen that empirical evidence is often relevant to the justification of a rule, and that procedures of justification are numerous and varied.

Rule Venture Moves

In these ventures rules are dealt with by moves having three different emphases. Some moves are concerned with the formulation of the rule, others with its justification, and still others with its application. These three types and the moves that comprise them are as follows:

I. Moves centering in rule formulation.
    - Rule formulation moves (move number 1)*
    - Range of application moves (move number 2)
    - Term explication moves (move number 6)

II. Moves centering in rule justification
    - Rule verification moves (move number 5)
    - Rule derivation moves (move number 8)

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* Move number corresponds to numbers given in the list of rule moves in the Appendix.

III. Moves centering in rule application
Case explication moves (move number 4)
Rule use moves (move number 7)
Combined case explication and use moves (move number 3)

The formulation moves are concerned with presenting. clarifying, or formulating a rule and with indicating the scope, range or purpose of the rule's application. Justification moves, on the other hand, attempt to render the formulation plausible. Only two types of justification were recognized in our sample of rule ventures. They are justification by deriving the rule from other rules or by verifying some trial application of the rule. Application moves are concerned primarily with the description of action guided by the rule in some specific situation. But the treatment of the specific cases may, on occasion, involve justifying the application of the rule to the specific case.

We shall discuss the foregoing moves and give examples of each as they occurred in classroom discourse.

Rule formulation move. There is considerable variability in rule formulation moves. When attempting to classify material in a venture, the transcript should be read completely and a decision should be reached as to what constitutes a formulation of the rule for the particular venture. In some rule formulation moves information will be given about the range of the rule, but if this information is an integral part of the rule formulation then it should be counted as part of the move.

Example 1

T: When you find that a noun or pronoun is to be modified, then you choose which modifier?
S: Adjective.
T: Yes, and for the other types of words you use . . . ?
S: Adverb.

In this example, the rule is formulated by both the teacher and the students. By means of open-ended sentences the teacher leads the students to provide the information that completes the formulation of the rule. The rule is that an adjective is used to modify a noun or a pronoun and an adverb is used to modify other types of words.

Range of application move. As the range is the class of actions or decisions to which the rule can be applied, the move's function is to indicate the situations in which it is appropriate to resort to the rule. What will serve as an expression of the range of a particular rule will depend upon the complexity of the rule. Also it is apparent that in many cases the context implies the range in various ways. Information given in previous lessons, general orienting statements at the beginning of a lesson, and text books or diagrams serve this function in many ventures.

There are thus many different types of range of application moves. In formulating a rule about the spelling of a word, the indication of the range of the rule is given by the particular word being dealt with in the rule. In one mathematics venture concerned with the ratio of areas of different figures the range of application move is given as follows:

Example 2

> T: Today we are going to talk about the triangles that are not equal in area.

The teacher then proceeds to develop theorems which relate triangles of unequal area, using the basic definition of the area of a triangle that has been taught in a preceding lesson. He proceeds to give an informal proof of the theorem that two triangles with equal bases and different altitudes are to each other in area as their altitudes; and of the theorem that two triangles with equal altitudes and different bases are to each other in area as their bases. Thus the range of application move serves to indicate the nature of the rules, in this case theorems, which are to be formulated in the venture.

Term explication move. The meaning of one of the terms in the rule formulation is noted or discussed in this move, hence it is essentially instrumental in character. Its function is to reduce ignorance of, and confusion about, the meaning of terms that figure in the rule formulation or range of application moves. As with the range of application move, what constitutes a term explication move will vary with the nature of the rule formulation move, especially with the degree of generality of the formulation.

In a spelling rule, term explication may consist of a discussion of the meaning of the word. For instance, in an English venture in which the teacher attempts to differentiate between the spelling of "accept" and "except," a term explication move occurs when the teacher says: "For this one (except), you might remember to think of the word "exception," because you know what an exception is."

A more general case of term explication occurs in a venture taken from a lesson in English. The teacher has dealt with the rule governing the use of adjectives in comparisons, using "er" and "est" endings. He has indicated that the form of the ending to be used depends upon the degree of the comparison. Then the following sequence of term explication moves occurs:

Example 3

T: So that reminds you of the forms to use. In comparing Kenny and Mike we had two involved, didn't we? And we used this second degree. Well, let's get the names of these degrees. What do we call the first degree?

S: Positive.

Example 4

T: And the second degree, the one in which we compared Mike and Kenny?
S: Comparative.

Example 5

T: And the name of the third degree?
S: Superlative.

In this sequence of moves the teacher is explicating the meaning of terms used in the rule formulation. He provides a terminology, or reminds the students of terms that they already know, by means of which the different types of comparison can be mentioned.

Rule verification move. A rule (whether acceptable or unacceptable) is applied in some specific situation, and the resultant action or decision is tested against some explicit or implicit standard appropriate to such an action in these situations. The function of this move is to determine whether or not the result of applying the rule to a particular case does, in fact, lead to a correct or satisfactory outcome. It is analogous to the testing of a general hypothesis by the examination of a concrete example. So this move provides a powerful device for the rejection of wrong rules, and can be used to provide support for correct rules.

The following move exemplifies the negative use of this type of move. In the preceding discussion the teacher has drawn from a student a rule purporting to govern the use of 'a' and 'an.' The teacher summarizes the student's offering, which is that 'an' is used for the plural subject and 'a' is used for the singular. The teacher then proceeds to test the proposed rule by a rule verification move:

Example 6

T: Well, let's see. I'm going to say "an apples are good for us" and "a apple is good for us." Is this what you mean?
S: No. Is it the opposite?

The teacher applies the student's rule to an instance, and asks him to judge whether the rule fits the instance. It is interesting to note that although the student was unable to formulate the rule correctly, he decided that the example was incorrect, presumably by reference to his intuitive and unformulated knowledge of the language. The teacher then proceeds to elicit a correct formulation from the class.

Rule derivation move. The way in which a rule may be derived from other rules is noted or discussed, or a demonstration is given that the rule is equivalent to or incompatible with some other rule. Where the rule concerns a theorem or formula as a guide to action in certain situations, this move may involve proving the theorem or formula, but does not include the theorem or formula thereby proved.

Almost all of the examples of this type of move are concerned with the development or justification of one rule by deriving it from another rule which is taken to be true. In geometry lessons the moves provide proofs of theorems, or the development of further formulas based on given formulas. In physics lessons the moves derive one formula from another.

Example 7

T: . . . Likewise, if the initial velocity is zero, what does this ($S = Vo^{\frac{1}{2}} + A T^2$) reduce to?
S: $\frac{1}{2} A T^2$.
T: One-half A times T squared, which is the same equation you have in your book. But you see then that these equations which have V sub-zero in them are more general; they will apply to more situations than will the specialized equations that are given in the book.

In this move the teacher presents a general formula. He then shows that if certain elements in the formula are given zero values, the formula reduces to the particular formula that has been used in class. This derivation of the special rule from the more general rule provides a justification for it. In this particular example, however, the teacher fails to bring out the fact that the range of problems to which the special rule had been applied actually met the restrictions that the special rule involved. To this extent, his derivation constitutes an incomplete justification of the rule.

Case explication move. A particular situation or type of situation is presented and explicated in terms which indicate how the rule is to be applied. This explication may serve to justify the use of the rule in the particular case.

A great part of instruction in rule ventures is concerned with the teaching of the rule through the application of it to particular cases. This move provides the analysis and clarification of the cases so treated, and may serve to show that the case falls within the range of the rule.

Example 8

(The formula being used here is S (distance) = the product of the average velocity and the time of travel.)

T: O.K. Let's look at number five. Tell us what is given.
S: Given? The distance that the ball falls, 400 feet.
T: What's the symbol for distance?
S: S equals . . . the quantity . . .
T: What is the distance?
S: Four hundred feet.
T: What else is given? What are we to find?
S: You're supposed to find the velocity.
T: Wait. Now think, what are we to find?
S: We're supposed to find the time.
T: O.K.

A general formula is being used in this venture. In this move the teacher explicates the problem by making clear the values of the variables in the general formula and by indicating which of the variables in the formula is unknown and needs to be found after the substitutions and calculations have been made. By explicating the case the teacher orders the information that is given in such a way that it can be used in conjunction with the rule to provide the desired solution.

Use move. In moves of this type, activity which is guided by the rule is carried out or described in a way distinguishable from case explication.

To use a rule is to be guided by the rule when performing activities of an appropriate sort. On the one hand, there is the individual case that falls within the range of the rule, and on the other, there is the rule whose content gives directions as to action in cases of this sort. To use the rule correctly is to follow the directions for action in the individual case. There are incorrect actions in many instances and these may result from either an incorrect use of the rule or an application of the wrong rule.

Example 9

T: How would this 'already' by used?
S: They were there already.

Example 10

T: Use 'who's' with the apostrophe.
S: Whose shoes are those?*

Example 11

The formula ($A = \frac{1}{2}bh$) has been provided, and the particular values have been explicated.

T: . . . which gives you what area?
S: Twenty square units.
T: Correct.

---

* The student has given an incorrect answer in this example.

Each of these examples is short, but this is not characteristic of all use moves. Such a move may involve a lengthy series of computations, as when a number of calculations is needed to solve an equation into which the particular values given in the problem have been inserted. In each case, the use move involves an activity which is directed by the content of the particular rule which is seen to be relevant to the problem under consideration. A case explication move contrasts with a use move in that the case explication move prepares for the rule's use, whereas the use move, as each of these examples shows, is concerned with the output of an application of a rule to a particular case.

Combined case explication and use move. In this move, both explication of the problem or situation and use of the rule in the situation are carried out in an integrated way, so that it is not possible to distinguish them without risk of losing significant content.

Example 12

T: Number one?
S: The two triangles have the same altitude so you compare the bases, and the base of ABD is 5 and the base of triangle ADC is 15. So it would be 5 over 15, and that is, to put it in a simpler form, one over three.
T: All right. So the triangles are to each other as one is to three, or one of them is a third as large as the other. In that case, your altitude (referring to a diagram on the board) is what line?
S: A D.
T: O.K.

It becomes difficult, in some cases, to separate the statements that are purely explicative from those which describe the use of the rule and, in this example, it can be seen that they are closely interwoven. The first sentence of the student's first utterance is explicative--the rule to be used is indicated and the values given in the problem are indicated. In the second and third sentences the student is using the rule; in the second by stating her answer in an unsimplified form; in the third by giving a simplified answer. The teacher's statements are somewhat divided in function. The first two sentences of his second utterance are essentially use sentences, but his last sentence and the student's response are explicative. In some cases it is even more difficult to distinguish the two types of application-centered moves, and attempts to do so lead to fractionalization of the venture beyond the level of adequate description. Thus, combined case explication and use moves tend to shade into either use or case explication moves.

Distribution of Rule Ventures

Although the sample of rule ventures is small, it is of interest to note how the rule ventures are distributed by subjects. This distribution is shown in Table 17.

Table 17

Distribution of Rule Ventures by Subjects

	Science	English	Sociology	Math	Core	History	Total
Rule Ventures	3	18	2	20	--	--	43
Total Ventures in the Subject Area	243	127	35	35	46	151	637

Of the 43 rule ventures, 38 occurred in either English or mathematics, and this would seem to reflect the important role of conventions in the former and of analytic statements in the latter. The relative frequency of occurrence of rule ventures when related to the total number of ventures of all kinds occurring in each subject area provides the following order of subjects:

Mathematics: 1 rule venture for each 1.8 ventures
English: 1 rule venture for each 7 ventures
Sociology: 1 rule venture for each 17.5 ventures
Science: 1 rule venture for each 81 ventures
Core: 0 rule venture for each 46 ventures
History: 0 rule venture for each 51 ventures

Thus there seems to be a clear distinction between the frequency of occurrence of rule ventures in English and mathematics on the one hand, and in the natural and social sciences on the other.

The empirical nature of the content of the low frequency areas would suggest that rules might play a less significant rôle in the treatment of this subject matter than they do in the areas of English and mathematics. There is perhaps an element of surprise in the low occurrence of rule ventures in core, history, and sociology lessons. These areas are concerned with the actions and reasons of men and one might anticipate that rules would figure prominently in them, but these subjects apparently do not provide rules to govern immediate action. Consequently, on the basis of these limited data, it seems that the distribution of rule ventures may reflect the influence of the subject matter.

Types of Rule Ventures

In the discussion of the nature of a rule and in the grouping of moves, three separate foci of interest were mentioned: formulation, justification, and application. In attempting to classify the ventures in a manner that might be useful in research and discussion of rule ventures, and in the construction of strategies, the same three foci were used. Ventures were classified according to the different groups of moves represented in them.

Type I. Ventures containing only formulation moves (4 ventures).

Type II. Ventures containing only application moves (3 ventures).

Type III. Ventures containing formulation and justification moves (5 ventures).

Type IV. Ventures containing formulation and application moves (26 ventures).

Type V. Ventures containing formulation, application, and justification moves (5 ventures).

Type I. In these ventures the rule is given without justification or application. It would seem that this type of venture serves either to revise a known or partly known rule or to express a rule that is sufficiently clear and simple to permit easy application. For if a rule is new or complex for the students, formulation without application runs the risk of producing 'verbal' rather than 'active' knowledge of the rule. Spelling rules, at least in the case of ordinary words dealt with at the high school level, meet this requirement of simplicity and clarity.

Type II. These ventures deal with a rule that is known to the students. They are peripheral cases of rule ventures, and shade off into procedure ventures. The three ventures in this group were not classified as procedure ventures because they were more concerned with behaving in accordance with the rule than they were with the exhibition of a sequence of actions appropriate to a given end. Thus, in one case, the teacher set a series of exercises in which the students had to use the rule that they had just been taught about spelling and the use of the apostrophe. This venture contained a series of complete application moves.

Type III. In these ventures the rule is justified by derivation or verification. The derivation may include such things as the proof of a theorem or the deduction of a formula, and the verification involves testing some performance carried out in accordance with the rule against some standard. This kind of venture serves to bring out the meaning of the rule and its relation to other rules, or to give some idea of the limits and results of the application of it.

One of the ventures in mathematics contains moves 1-5-1. The teacher opens with an indication of the rule that the area of a rectangle is given by the product of its base and its height (move 1); she then proceeds to verify this by using a particular rectangle that has been marked into squares (move 5); and finally she states the formula again (move 1).

Type IV. This is the typical kind of rule venture. It combines both formulation and application moves, and thus serves to teach both 'verbal' and 'active' knowledge of the rule, and to teach new or known rules. A teacher may often be warranted in avoiding the justification of a rule that he has to teach. Indeed, there are many rules for which justification would appear to be superfluous. However, it should be noted that if the teacher aims to develop a critical knowledge of a rule, this kind of venture may be defective, for it places the responsibility for such development solely on the student.

Type V. These ventures are the most complex type, and in them the student is exposed to information relevant to the three foci of interest. Consequently, this kind of venture can be used to achieve all the purposes that the other kinds are used for as well as to give the student a more rounded experience with the rule. On the other hand, as economy of time and effort is required in the classroom, it seems reasonable to restrict the use of this kind of venture to the teaching of rules of special importance.

The following venture from a class in geometry exemplifies this kind of venture. It contains moves 2-1-8-1-3-1-7-1-3-1. The venture opens with the statement that "we'd like to find out some things that make figures that don't look alike, equal" (move 2); then a brief derivation is given for the first rule (move 8); the rule is formulated as "Two triangles are equal if they have equal bases and equal altitudes (move 1); this is applied to a particular pair of triangles (move 3); a corollary of the first theorem is given (move 1); the teacher summarizes the findings of the three moves (move 7); a second corollary is stated (move 1); the second corollary is applied to a further case (move 3); then the venture is concluded with a resume in which each of the rules is stated (move 1).

The frequency with which these five types of ventures were found in classroom discourse is shown in Table 18.

Table 18

Frequency of Types of Ventures by Subjects

Subject Area	Number of Teachers	Number of Classes	I	II	III	IV	V	Total
Physics	1	5			1	2		3
English	1	5	3	1		12	2	18
Sociology	1	5			1	1		2
Geometry	1	5	1	2	3	11	3	20
Total	4	20	4	3	5	26	5	43

It can be seen that the Type V venture occurs infrequently. This venture provides the most complete treatment of a rule, and its rare use is a function of the general tendency in the sample to minimize the justification of rules. The most common venture is Type IV in which the rule is formulated and applied. Although the number of cases is small, it seems that Type IV venture is important in all subject areas.

Patterns of Moves

The question naturally arises as to whether or not the moves that recur in classroom discourse appear with any regularity. Three procedures were followed in an effort to throw some light on this question. One procedure is to tabulate consecutive pairs of plays which occurred in the ventures. With eight kinds of plays, there are 56 possible consecutive pairs, only 34, or approximately 60 percent, actually occurred.

Table 19 shows the frequency of pairs of plays. A new play, 'complete application,' has been used in this table. Complete application plays were derived in the following way. Where a combined case explication and use move occurs it usually means that a complete application of the rule being applied to a particular case has been carried out. In preparing the material for the following table, sequences of both use and case explication moves were--where the transcripts warranted--combined to form a 'complete application' move, which is the same as the combined case explication and use move. Plays were then constructed of sequences of complete applications whether they contained 3 moves or both 7 and 4 moves.

Table 19

Pairs of Plays in Rule Ventures

Second Play

First Play	Rule 1	Range 2	Complete Application	Case Explication 4	Verification 5	Term Explication 6	Use 7	Derivation 8	Finish	Total	Percent
Rule 1		7	25	6	2	8	25	4	13	90	34%
Range 2	26		1	2	-	-	7	4	2	42	16%
Complete Application	19	2		-	1	1	10	-	15	48	18%
Case Explication 4	10	-	1		-	1	-	-	-	12	4.5%
Verification 5	3	-	1	-		-	-	-	-	4	1.5%
Term Explication 6	4	2	4	-	-		1	-	5	16	6%
Use 7	17	5	10	-	-	4		-	7	43	16.5%
Derivation 8	6	-	1	-	1	-	-		1	9	3.5%
Commence	5	26	5	4	-	2	-	1	43 No. of Ventures		
TOTAL	90	42	48	12	4	16	43	9			264 = No. of Plays for all Ventures

There were 583 moves in the rule ventures, but there were only 264 plays. This reduction indicates that over-all there were 2.2 moves per play. But the over-all average obscures the fact that most of the reduction occurred in the rule application group. There were 396 moves in the application group, but only 103 plays. Thus there were approximately four moves per play in this group. There were 187 moves in either the formulation or the justification groups, and 161 plays. Thus there were 1.2 moves per play in these groups.

These statistics can be interpreted to mean that there is a strong tendency to make a long sequence of use moves or complete application moves but there is only a very slight tendency to repeat other moves. It could be said, perhaps, that one of the principles teachers follow in teaching rules is to repeat applications of the rule.

Table 19 indicates that the usual way of initiating discussion in rule ventures is to indicate the range of the rule in question. As was pointed out in the discussion of this move, the indication of the range of the rule may be given in many ways and will probably be rather perfunctory. However, the general principle of opening with a range of application move is both dominant (it occurs 60 percent of the time) and sound (for it serves to orient the pupil).

There is no single preferred concluding play, but complete application plays and use plays together account for 50 percent of the closing moves. However, there is also a fairly strong tendency for the venture to conclude with a rule formulation move.

There is considerable variety in the manner of termination, and it is possible that the different concluding moves function in different ways. It seems reasonable to regard the concluding rule formulation move as a form of review of the point of the venture. The concluding use moves would seem to have a checking role: the teacher gets the class to apply the rule or does so himself, but does not require an explication. On the other hand, the conclusion by means of a complete application suggests a more cautious approach: the venture is not closed with review of the rule, but is closed with a complete application that serves to clarify the application of the rule as well as to make the application.

Most of the order in Table 19 can be explained in terms of the tendency of the rule formulation play to alternate with other sorts of plays. Examination of the '1' row of the table shows that the '1' play is followed by all of the other plays, and examination of the '1' column shows that the '1' play follows all the other plays. As long as the venture continues, there is a strong tendency for the teacher to return to a formulation of the rule before introducing a different type of play. It seems that the rule formulation moves function like a star to keep the ship on course. By constant reference to the rule, the progress of the venture is regulated to ensure that the relevance of the material in the other types of plays is brought out.

The range of application and rule formulation combination occurs most frequently; there are 26 entries in the cell. Further, as the 2 move is the dominant opening move, this sequence occurs mostly as the beginning of the venture. Seventeen of the ventures begin in this fashion. Thus a basic pattern for opening a rule venture involves, firstly, some indication of the range, and secondly a statement of the rule. If the rule is not known to the learners, then this initial rule formulation will need sharpening up or restatement subsequently; but the "return to rule" tendency indicates that this is what the teacher will usually do.

Another procedure for finding out whether or not plays occur in any sort of pattern is to analyze the position in the venture at which a play occurs.

Are particular kinds of plays more likely to occur at the beginning of a venture, or at the end of a venture? Tabulation of plays by exact position (i.e., first play in venture, second play in venture, etc.) is likely to be confused by the fact that ventures vary in the number of plays that occur in them. For instance, the fourth play may constitute the end of one venture, but the middle of another venture. If it is assumed that each venture constitutes a complete unit of discussion, then it is more appropriate to treat each venture as divisible into four equal units (a first quarter, second quarter, third quarter, fourth quarter) regardless of the number of plays it contains. The frequency of plays occurring in the four quarters of each venture is recorded in Table 20.

The data in these tables were obtained by dividing each venture into four equal parts and tabulating the frequency of plays, or fractions of plays, which occurred in each of these parts.

Table 20

Distribution of Plays Over Quarters of Ventures

Move No.	First Qtr.	Second Qtr.	Third Qtr.	Fourth Qtr.	Total
1	17	26 3/4	24 3/4	21½	90
2	27	6	6	3	42
C.A.	5	12	11½	19½	48
4	5	5	1	1	12
5	--	1½	2½	-	4
6	3	5	3¼	4 3/4	16
7	7	7	14½	14½	43
8	2	2 3/4	2½	1 3/4	9
	66	66	66	66	

It can be seen that 27 of the 42 range plays occur in the first quarter. Once an allowance is made for this preponderance of 2 moves in the first quarter, there is little evidence to suggest a positioning of plays. Thus, the 1 play occurs about equally in each of the three last quarters; as do most of the other types of plays. However, a slight positioning effect seems to occur with 4 and 7 moves. The entries for the 4 and the 7 rows indicate that the case explication move occurs earlier than does the use move unsupported by explication. Thus, ten out of twelve 4-plays occur in the first half of the ventures, whereas 29 out of 42 7-plays occur in the last half.

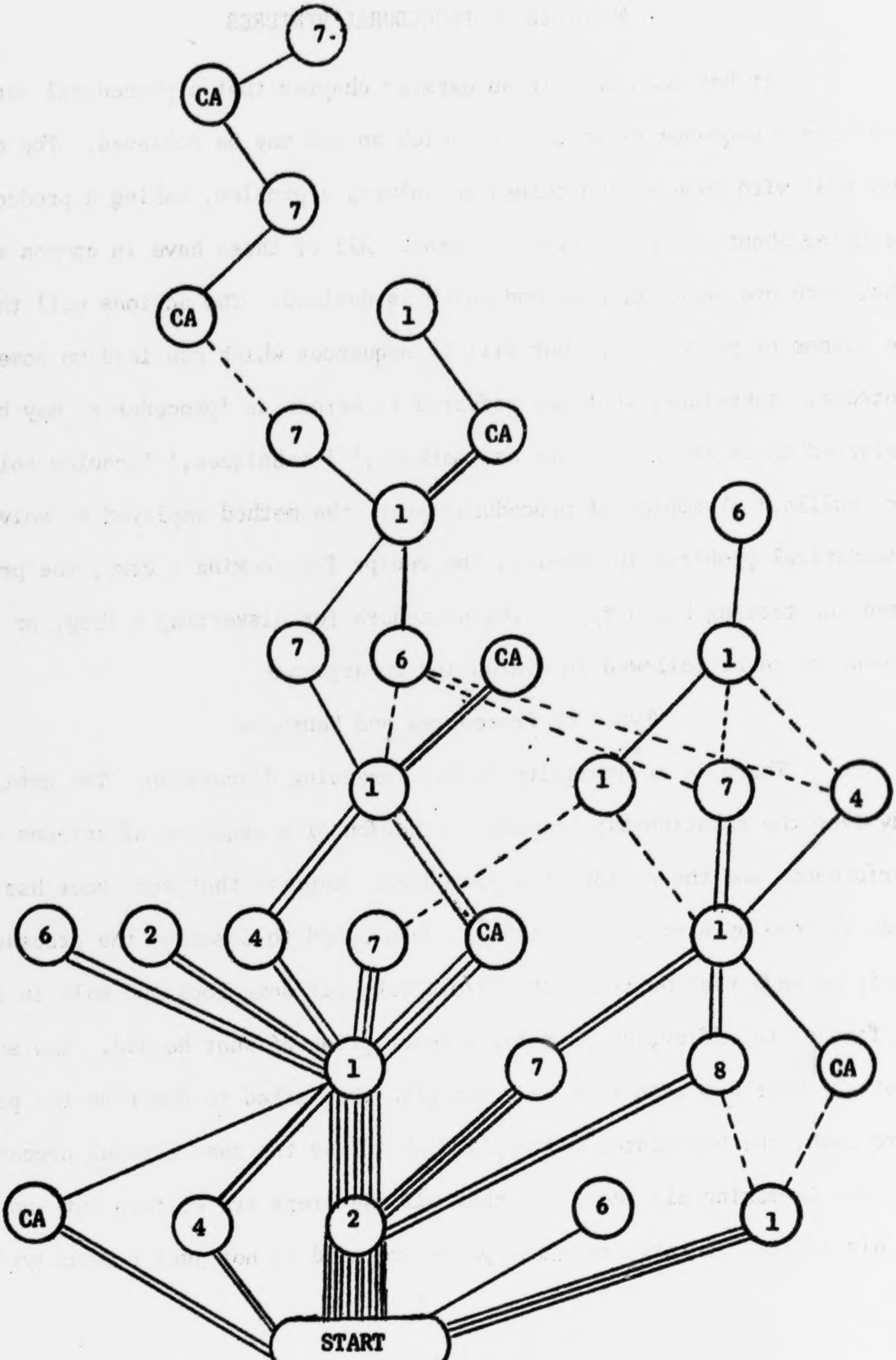
The general conclusion that follows from the results of the search for positioning of plays is that freedom of treatment occurs at most points of a venture. This means that within the limits of the "return to rule" tendency and the early occurrence of 2 moves, any type of play tends to occur at any point in the venture. The position data suggest that the teachers are quite flexible in their exposition.

A further analysis of the sequencing of moves in rule ventures was made by means of a flow chart. The flow chart was constructed in the same manner as was the flow chart for conceptual ventures, and the reader is referred to that chapter for a description of the procedure and the interpretation.

It can be seen that there is a tendency in rule ventures, comparable to that in conceptual ventures, of returning to a characteristics move. In rule ventures, the tendency is for the discussion to return to the rule formulation move. If the main branch of the flow chart is examined, it can be seen that most ventures open with a 2 play (range of application) followed by a 1 play (rule of formulation). Then considerable variation is exhibited in the next play, and after this there is a return to the 1 play.

The flow chart and the other analyses indicate that there is a strong tendency for rule ventures to open with an indication of the range and then to proceed to a formulation of the rule; and thereafter to alternate rule formulation moves with a variety of other moves, so that there is considerable flexibility of treatment in the body of the venture.

Rule Ventures Play Flow Chart 11


7
CA
7
CA
1
7
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7
6
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8
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4
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6
1
START

Chapter XII

ANALYSIS OF PROCEDURAL VENTURES

It has been said in an earlier chapter that a procedural venture exhibits a sequence of actions by which an end may be achieved. The sequence may deal with such varied things as solving a problem, making a product, or bringing about a certain type of event. All of these have in common the fact that each one leads to some end which is desired. The actions will thus not be random or purposeless, but will be sequences which can lead to some desired outcome. Therefore, what are referred to herein as 'procedures' may be also referred to in other contexts as 'methods,' 'techniques,' 'problem solutions,' or 'skills.' Examples of procedures are: the method employed to solve theoretical problems in physics, the recipe for cooking a cake, the procedure used for testing blood types, the procedure for dissecting a frog, or the procedure to be followed in evaluating an argument.

Types of Procedures and Ventures

There is an ambiguity in the foregoing discussion. The ambiguity involves the relationship between the notion of a sequence of actions or a performance and the notion of a procedure. Suppose that some beer has been made at home by a novice beermaker. When asked to describe the procedure he used, he says that he took out the old tub, put some hops and malt in it, and so forth. In effect, he provides a description of what he did. Now suppose that the beer has been made by a brewery. When asked to describe the procedure used, the brewmaster may reply that it was the same careful procedure as he uses in making all beer, and that all the steps are written out and locked in his office. In this case the procedure used is not just a description of the actions performed when a particular vat of beer is brewed; it is a statement of an abstract method that is being followed in a particular case.

The point is that sometimes by "procedure" is meant nothing more than the sequence of actions that took place or will be taking place. The term "performance" will be used to convey this sense. On the other hand, "procedure" is often used to refer to an abstract structure, or set of ideas, which determines the sequence of actions to be performed on a particular occasion. It is to this abstract conception that we refer by the term "procedure." Thus a procedure is an abstraction that may be described independently of a particular sequence of actions utilized in achieving a desired outcome in a certain situation, and when we talk of procedural ventures it is a procedure in this sense that we take to be the objective.

Of course, not all sequences of action are guided by a procedure, although they may conform to it. But where a performance is given in a procedural venture it is held that the objective of the venture is the procedure which can be abstracted from the particular performance.

At this point a further complication arises. Procedures may be either _ad hoc_ or established. _Ad hoc_ procedures are those that come into existence only when a unique problem is attacked, and many examples spring readily to mind. Established procedures are pre-existent and formulated independently of the particular problem in hand. For example, the procedure for identifying blood types is well established, as are many recipes for cooking, techniques for locating troubles in electronic equipment or methods for establishing the validity of an inference.

Of special interest in this discussion is the fact that most of our ventures involve *ad hoc* procedures. An examination of the transcripts indicates that the method of solving most of the problems was developed as the venture proceeded. Only two ventures clearly involved established procedures: one dealt with the standard technique for dissecting a frog, the other referred to an established test for the identification of a sulfate.

Procedural ventures differ, therefore, in terms of the origination of the procedure treated. Where the procedure is *ad hoc* it makes sense to talk of the development or creation of the procedure in the venture, but it does not make sense to talk of the procedure being followed or applied. On the other hand, where the procedure is established or pre-existent it makes sense to talk of following or applying the procedure to the problem at hand. To avoid mere pedantry we have not tried to be rigorous in our terminology at all points in the discussion. But the distinction is significant for it gives rise to this question: to what extent are we justified in grouping ventures that deal with *ad hoc* procedures together with ventures that deal with established procedures?

It was stated above that not all sequences of action are guided by a procedure. Normally one would not ask a question such as "What procedure did you follow when you sat down?" or "What procedure did you follow when you wrote out the letters of the alphabet?" This means, in part, that we would not think of all sequences of action as procedure-creating. There would need to be some naturally identifiable outcome and some interest in seeing the structure of the performance before a sequence of actions would be classified as procedure-creating. But most of our sample of procedural ventures contain solutions to problems that seem to be created in the particular lesson and are probably not returned to later. Granted that a goal or end is identifiable (to reach a certain solution), why is it that we have thought that the element of abstraction is present in these ventures?

The answer to this question is that we have made an assumption. We have assumed that when a teacher shows how to solve problems in class or has the pupils develop a solution under his guidance, he is interested in bringing about a generalization on the part of his pupils. He is not, presumably, interested in their being able to reproduce the same sequence of actions as was performed if ever the identical problem should be encountered again. He is, it seems more reasonable to suppose, hopeful that the students will be able to solve problems similar to that whose solution has been demonstrated, when they meet them.

A criticism might occur to the reader. In the discussion of the nature of a venture objective in Chapter III, it was pointed out that the objective of the venture should not be identified with the intention of the teacher. And yet the above assumption seems to involve just this idea. But what we have rejected is the claim that what the reader understands as the cognitive import of the venture in any particular venture is identical with what the individual teacher sought to teach in the venture. The above assumption, however, is based upon general considerations about the nature of the school. School teachers are supposed to be interested in helping their pupils abstract, and they are not supposed to be interested in mere display of their ability to perform sequences of actions that lead to the solutions of problems. Our assumption, then, can be put this way: there is a pedagogical interest in bringing students to a general and transferable understanding through the study of particular problems.

The above discussion has attempted to show why an observer or reader of the transcripts would classify ventures, employing what have been called ad hoc procedures, as procedural ventures. But why should the students take the observed performance to be indicative of the correct procedure? Our answer is, of course, speculative, but it seems plausible. The teacher is the chief figure in the classroom; he is the expert and in most cases determines what is right or wrong. The teacher is an authority for the student. This is true in all sorts of ventures, not just in procedural ventures. So even though there may be no procedure applied in the venture, but rather a performance given, the authority of the teacher means that the performance he gives or accepts has the quality of a public, established procedure. By virtue of his authority, his performance or a performance that he approves of is procedure-creating. The sanction of the teacher means to students that even if the procedure is appropriate only to a problem the same as that solved, the performance indicates the way that the problem is to be solved should it be encountered again.

When the teacher shows the class how to solve a problem he is implying that this is the best way, or, at least, that it is a good way for his students to solve this problem or one like it. When he accepts a performance that a student offers, then he is putting his seal of approval on it. Even if there is no established procedure being applied to the problem in question, when the teacher accepts or gives a performance there is an implicit direction and advice that this sort of performance should be repeated when a similar problem is to be solved. The way that the teacher does something, or a way that he accepts, becomes a recommended way of doing it for his students.

Before proceeding to two general points, we can summarize. The above discussion distinguishes a performance from the procedure being performed or developed, and provides a rationale for the procedural venture category in that it establishes that the objective of the venture is still a procedure regardless of whether ad hoc or established procedures are treated in a venture.

Of the two general points that will be considered, the first is concerned with the venture system itself, and the second is concerned with the teaching of procedures as revealed in the observed ventures.

Two different types of procedures can be distinguished: symbolic procedures, and manipulative procedures. In symbolic procedures the sequence of actions involves making statements, drawing diagrams and so forth. The solution of problems in physics or geometry will usually involve symbolic procedures. Manipulative procedures require the movement of objects and the transformation of materials, and involve motor skills. For example, the dissection of a frog or the cooking of a cake are manipulative procedures.

When manipulative procedures occur in ventures, the performance will be extra-verbal. But the venture system has been created to analyze the discourse occurring in the classroom. This does not mean that no provision is made in the system for describing procedural ventures in which manipulative procedures are involved. We have analyzed a venture dealing with the dissection of a frog in the same way as other ventures have been analyzed. It does mean, however, that the system can only analyze these procedures if they are described verbally. Consequently the analysis of lessons in subject areas involving many manipulative procedural ventures might not be appropriately carried out using the present system.

A technical point following from the same distinction should be noted. The sequence of actions in a manipulative procedure is non-verbal and may be described by words. The sequence of actions in a symbolic procedure will consist of words or other symbols. However, no distinction is made in the move analysis between the words which describe a manipulative procedure and the words by means of which a symbolic procedure is performed. Both are treated as descriptions of performance. In the main this is because the best description of the sequence of actions comprising a symbolic procedure is the discourse which the performers produced.

The second point concerns the process of abstraction from performance to procedure. With both established and ad hoc procedures the teacher can explicitly discuss the procedure and thereby assist the student in the process of abstraction, or he can avoid explicit discussion of the procedure and thus place the burden fully on the shoulders of the student. Examination of the ventures indicates that mainly the teachers do not discuss the procedure directly. Even in the two ventures in which established procedures are used there is no discussion of the procedure itself independent of the problem to which it is being applied. However, the availability of sources in which the student can study the procedure probably minimizes the amount of abstraction that he must perform in these cases. What seems to be a genuine difficulty with the observed ventures is that in most of the ad hoc ventures there is little or no attention paid to the abstraction of the procedure from the performance. On occasion the teacher summarizes the steps that have been carried out or indicates the range of utility of the procedure developed. But, in the main, the responsibility for abstraction of the procedure from the performance is left to the student.

Types of Moves in Procedural Ventures

Three groups of moves have been distinguished: those concerned with the problem or situation to which the procedure will be applied, those concerned with the performance of the procedure, and those concerned with the development of the procedure and its abstraction from the immediate problem or situation dealt with in the venture.

Problem-centered moves provide information about, or analysis of, the problem or situation. This information or analysis covers such things as the identification of the problem of immediate interest, a statement of the information that has been given, the elucidation of the problem and a discussion of the constituent parts, and an indication of the outcome that should be reached when the procedure has been completed.

Performance-centered moves describe the performance by which the procedure is exercised in the situation or problem. In many cases there is no procedure that exists independent of the performance which leads to the solution, which is to say that the procedure is ad hoc rather than preexistent, and the teacher makes no attempt to abstract the procedure from the details and complexity of the performance with which the students have been confronted.

Even if there is no pre-existent procedure that is being applied to the problem in hand, presumably the students will be able to abstract the procedure from the performance and develop a technique for answering the problem or problems like it. Moves that are concerned explicitly with this abstraction of the procedure from the individual performance are procedure-centered moves. The sample of ventures revealed few instances of these moves, and in these the steps that had been carried out in the performance were summarized or briefly stated. Three other kinds of procedure-centered moves were identified in which the information deals directly with the procedure rather than with it in application to a particular problem. These moves indicate the range of utility or application of the procedure, describe or nominate some established procedure which has been exemplified or referred to in the venture, and discuss concepts that are instrumental to an understanding of the procedure.

The following list indicates the grouping of the moves.

I. Problem-Centered Moves
    Identification of problems
    Information giving
    Indication of end or outcome to be achieved
    Problem analysis

II. Performance-Centered Moves
    Introduction of recorded performance
    Characterization of performance

III. Procedure-Centered Moves
    Summary of steps
    Range of utility of procedure
    Instrumental concepts
    Discussion of procedure

Examples of Moves

Identification of problems. This move locates the problem or situation which is to be dealt with in the venture. The identification may be made in various ways. For example, the students may be referred to an exercise in a book, and this reference may consist merely of giving the number of the exercise. Or the students may be directed to a problem that has been written on the board. Again, the problem may be identified by some brief description, but only that part of the discourse needed for the identification should be counted in this move. Discourse that conveys information about the problem should be included in the information-giving move. The identification moves are, then, quite brief in almost all cases. Statements and questions such as the following serve to identify problems: "Number eight, Harry?"; "Let's return to the problem we started yesterday."; "Let's have number one on the board, Gerald."; "Let's do this for burning hydrogen in air."

Information giving. The information which is given in these moves is about the problem or problems to be dealt with in the venture, not about the procedure. The information is about the problem to which the procedure is to be applied or for whose solution a procedure is to be developed in the venture. Discourse which falls into this move states the details of the problem; it does not expand it or elucidate it. The move is concerned with establishing what is given. However, a statement of the end to be achieved is not included in this move, as a separate move covers this.

Example 1

After the problem has been identified the teacher continues:

T: Read us the givens, please.
S: You're given E as the mid-point of AB, and that BCDE is a parallelogram.

The teacher asks the student to state the "givens" for the exercise. In complying with this request the student has not stated all the information that is available in the text, but seems to have selected that which he feels to be especially pertinent to the solution. For example, he makes no mention of the point F in his statement, but this point must be introduced into the argument. This is probably typical of information-giving moves, and is certainly characteristic of the moves that this geometry teacher employs.

The brevity of the above example is not characteristic of all information-giving moves as some found in physics ventures are quite long. The following example, although not very long, gives much more detail.

Example 2

S: In this problem we had a block or weight of twenty pounds, resting on a surface, and the coefficient of friction between the surface and the block was 0.2, and the block was being pulled along the surface at a constant speed by a rope making an angle of thirty degrees with the surface.

Indication of end or outcome to be achieved. In this move the result to be achieved is indicated. Especially in those problems where the teacher does not want to give the student the answer, the end will be indicated in a general rather than in a specific manner. However, as in some of the exercises dealt with in the geometry lesson, there are ventures in which the result to be achieved is specified precisely. The following two examples contrast in this way.

Example 3

T: Now how would you identify an unknown solution if I told you that I believed it was a chloride or a sulfate?

Example 4

After identifying the problem and stating the given, the student proceeds to make the following statement:

S: We're trying to prove that triangle BDE is equal to triangle CED.

This difference in formulation of the move presumably reflects a difference in the kind of process that the venture involves. In those cases where the end is indicated in a general way, the task involves the discovery of some particular fact or value and the move serves to guide the student in his discovery. In the other case the task involves the proof or justification of some statement.

In classifying discourse care should be taken to differentiate this move from the characterization-of-performance move in which the actual result that the performance has produced is mentioned or described. To indicate the end or result is to describe the desired end, not the actual end. In conjunction with the information-giving move the end or outcome move can guide the selection of the procedure to be applied, whereas the characterization-of-performance move describes the final result of applying the procedure that has been selected.

Problem analysis. When the basic information has been given it is possible to describe its elements in such a way as to clarify them or to bring out the inter-relationship among them. This is the function of the problem-analysis move. It serves to explicate the problem or situation in a manner relevant to the aim of the venture. These moves therefore are sometimes difficult to differentiate from characterization-of-performance moves and from instrumental-concept moves.

Example 5

In this example the problem has been identified, some information given has been mentioned, and a previous problem-analysis move has been made, after which the teacher makes the following problem-analysis move.

> T: Now first, when you do that [put a fifty-gram weight on the rod], the rod is still seventy-two centimeters long. So, it travels. The end out here travels in an arc like this [pointing to the drawing on the board]. We have a fifty-gram force out there. But it does not act at the end of this horizontal rod, but acts in a little bit towards the center. So the length has changed from seventy-two centimeters to the length of the force arm, where this force will be somewhat less than seventy-two. Now how do we get that length? That's what we have to figure out. Then you also want to remember that the weight of the rod is still acting downward here--if you can figure out the weight of the rod--at around 720 grams. You'd better check that, but the weight of the rod is still acting downward at the center of gravity.

The teacher, in this move, is attempting to bring out the significance of the information that has been given in such a way that the pupils can use it in their attempts at solution of the problem. He mentions various bits of data, such as the length of the rod, and relates these to others, such as the effect of the addition of the fifty-gram weight.

Summary of steps. In this move the steps in a procedure are briefly described or summarized in a schematic way. In almost all of the ventures in our sample there was no pre-existent procedure being applied in the problem dealt with in the venture. This move, therefore, consists of an abstraction from the performance given or to be given in the venture. If an established procedure were being applied in the venture, then a brief summary of the steps in the procedure would fall into the same category.

Example 6

> T: Now when you write an ionization formula, class, especially just for one compound, practically all that you do is write the compound down and show how it's ionized if you have steam for it . . .

The problem which had been previously identified required the students to show the result of ionization of a compound. The teacher, in this move, is pointing out the essential steps that the students will have to take in their answer. In this example, the summary is given in a somewhat general way, that is, it is not framed in terms of the particular compound that is to be treated in the venture. Some summaries, however, are formulated in terms of the particular problem that is being treated. In both cases, this type of move helps to abstract from the details of the performance and to focus attention on the procedural skeleton that is needed for the solution of similar problems. It is this function of the summary-of-steps move that leads to its classification as a procedure-centered move.

Range and utility of procedure. In this move some indication is given of the range of the technique or procedure that is exemplified in the venture. The range or scope is given by indicating other problems or situations which can be dealt with in a similar manner as that treated in the venture. This can be accomplished either by giving a general category into which the problem dealt with falls or by indicating that other specific exercises can be handled with the same technique. Example 7 shows the general method and Example 8 shows the specific method.

Example 7

> S: Would it be possible to solve a weight problem like this if we did not know what the weight of the block was?

Example 8

> T: Now, I would like someone to put on the left blackboard the solution for that special problem that has been there for nearly a week now. I want someone who has used the same general technique as that which was used in solving the illustrative problem yesterday.

Instrumental concepts. A concept involved in the application or development of the procedure, and an understanding of which is needed for a grasp of the procedure, is mentioned or discussed. As was previously indicated, these moves shade into problem-analysis and characterization-of-performance moves. However, whenever some term or idea used in the statement of the problem, in the description of performance, or in the development of a procedure is given particular attention and developed briefly in its own right, this will normally be an instrumental-concept move. It should be noted that instrumental-concept moves will normally not be very long; if long examples are encountered it is likely that a venture boundary has been overlooked.

Example 9

A student has described his solution of a geometry problem and the answer has been given. The teacher than makes the following comment:

> T: Who noticed something he would like to correct about the way he gave the answer to his problem? I mean didn't you notice that he failed to tell us that the product of the sides is in square inches. If I heard correctly, you said 'inches.' The dimensions are given in inches but you get square inches for the area of the rectangle.

Introduction of recorded performance. The analysis of moves is primarily concerned with the verbal aspects of classroom behavior, and especially with the spoken discourse. However, it was felt that some move was needed to cover the situation found in procedural ventures in which some finished performance carried out in writing is introduced into the discussion and is available for the class to see, even though it may not be completely described orally. Otherwise, the moves seem to lead to illogical outcomes, for a characterization-of-performance move could be given that dealt with the end or outcome although there had been no indication that the performance had been carried out.

The typical situation covered by this move is one in which the teacher or a student writes on the board a solution to some problem. After he has completed his performance the class may be referred to it. They may be especially directed to pay attention to the answer by such questions as "Is that right?" There may be other situations in which, for purposes of clarity in analysis, this move should be used.

Characterization of performance. The main point of this move is that in it the performance is described, discussed, carried out or evaluated. It should be remembered that by "performance" attention is directed to what was done in order to achieve the end or result desired in the particular problem dealt with in the venture. Descriptions that attempt to abstract from this, as in the summary of steps, are procedure-centered moves. Descriptions that describe the problem or situation rather than the development of a solution to it are problem-centered moves.

Three sub-classes of the characterization-of-performance move have been distinguished. The first one is of moves that completely describe the performance in such an integrated fashion as to make a distinction between parts of the performance arbitrary and difficult. The second is of moves in which a part of the performance is described in such a manner as to permit the distinguishing of it from adjacent parts. The third is of moves which directly refer to the result or outcome of the performance. This last group was distinguished because teachers usually refer to the end or result achieved as a means of checking the performance and of drawing the attention of others to the correctness of the performance. Example 10 exemplifies the first type; Example 11, the second; and Examples 12 and 13, the third.

Example 10

The student has written his answer on the board, and now, referring to the diagram by gesture and symbols, he gives an integrated description of it.

> S: I drew this x, y axis, which I figured by multiplying. I figured out that this weight--W2--times this moment [points] should equal this distance times its weight, plus this distance times its weight of fifty grams . . [The student continues in this way for several more minutes.]

Example 11

In this venture the teacher is dissecting a frog and is concurrently describing his actions. The venture consists of an identification move and a series of moves describing the performance step by step.

> T: All right. Now that we have seen the top of the frog we'll just skin him the rest of the way. [He removes the outer skin covering the rest of the frog's body as he talks.] So you can see what he's like all skinned, we'll take the skin off his abdominal part and off around his forelegs . . . .[does so].

Example 12

In a physics venture used in Example 10, the student and teacher conclude the description of performance by jointly indicating the final result as follows:

> S: And that [points to answer] is what I get.
> T: Twenty-eight degrees and 34 minutes.

Example 13

In a geometry venture, after several problem-centered moves, a number of descriptions of specific parts of the performance is given, and an instrumental-concept move is followed by a move which explicitly mentions the outcome.

> T: We have just proved that the triangles AEB and DEC are what?
> S: Equal.
> T: Equal. Do you note that that trapezoid does not have or is not marked as an isosceles trapezoid? So whether the triangles, AEB and DEC, are parts of an isosceles trapezoid or not, you have just proved that they will be equal anyway.

Discussion of procedure. In this move attention is directed to a procedure itself rather than to its application to some specific problem. Procedures, it has been argued, may be of two kinds, pre-existent and *ad hoc*. The *ad hoc* procedure is the technique that is revealed by the specific performance carried out in the venture. The pre-existent or established procedure is a procedure existing independent of the particular problem to which it is being applied in the venture. Apart from the summary-of-steps move, very little attempt was made in the sample of ventures to characterize ad hoc procedures. So, this discussion of procedure moves refers only to established or pre-existent procedures. There is only one example of this kind of move in the sample, but it is felt that more sophisticated instruction or instruction in different areas would provide more examples.

In Example 14 the teacher refers to an established procedure for determining whether some unknown substance is a sulfate. The procedure is one used in various laboratories and written about in textbooks. All the teacher does in the venture is refer to it and describe it briefly.

Example 14

[The teacher asks what test is used to identify a sulfate.]

T: He just got through giving it to us in his report. Barium . . . ?
S: Chloride.
T: Barium chloride. If you're given a white precipitate, you may have sulfate. Of course, there are other things that give you a white precipitate but that's one way we test for sulfate.

The Distribution of Procedural Ventures

There are only twenty-five procedural ventures, so no definite conclusions can be drawn as to their distribution in terms of subject areas. However, as the following table reveals, the data do suggest that these ventures occur with differential frequency in different subject areas.

Table 21. Distribution of Procedural Ventures by Subject Areas

	Physiology	Biology	Physics	Chemistry	Total	Mathematics	Total
Procedural Ventures	0	1	8	8	17	8	25
Total Ventures	53	76	22	92	243	35	637*

*Total for all ventures in all subject areas.

It can be seen from Table 21 that procedural ventures occur mainly in physics, chemistry, and mathematics in the sample. They have a very low frequency in the biological area. They were not found at all in the lessons dealing with English, history, sociology, or core areas. It seems to be the case that these ventures are used in theoretical or formal sciences rather than in the more descriptive natural sciences, the humanities, or the social sciences.

Intuitively, this distribution seems to be reasonable for the subjects included in our sample. Investigation of lessons dealing with technological subject areas, such as industrial arts, might be expected to reveal a wide range of procedural ventures being employed therein. The data available at this time, however, do not include instruction in these areas.

Kinds of Procedural Ventures

On the basis of the kinds of moves used in them three different categories of procedural ventures can be distinguished. Type I utilizes moves from the problem-centered group and from the performance-centered group. Type II utilizes moves from the problem-centered group. Type III utilizes moves from all three groups.

There were eighteen Type I ventures, of which eleven were in physics, one in biology, seven in chemistry, and six in geometry. The single Type II venture was found in chemistry. Of the six Type III ventures three came from physics, one from chemistry, and two from geometry.

In the Type I venture, the problem is identified and discussed and a performance is given, but no attempt is made to draw out the procedure from the performance. If there is to be any abstraction, then the student must do it himself. In the Type II venture, the problem is identified and discussed and the related procedure is indicated, but no performance is given that applies the procedure to the problem in hand. In the Type III venture, the problem is dealt with, a performance is given, and some attempt is made to abstract the procedure from the performance or to refer to or discuss an independent formulation of the procedure. Even in the observed Type III ventures, however, teachers did very little in the way of developing or abstracting the procedure.

Patterns in Procedural Ventures

As the accompanying diagram indicates, twenty-three out of twenty-five ventures begin with an A group play. Of these twenty-three, only one does not begin with an identification-of-problem move. In the three ventures that do not begin with this move, it is employed in the second play. That is, the problem to be treated is identified as early as possible in the venture, and the venture typically starts in this way.

It can be seen that of the twenty-five ventures, eighteen end with a B group play. All of these eighteen ventures end with a characterization-of-performance move; none ends with an introduction-of-recorded-performance move. Ten of these performance-characterization moves describe the outcome or end of the performance, seven describe another part of the performance, and one gives an undifferentiated description of the performance.

Most of the ventures--eighteen of the twenty-five--have a simple structure. They are Type I ventures, utilizing moves from the problem-centered and the performance-centered move groups. The diagram indicates that eight of these ventures have the pattern, AB; two have the pattern ABA; and eight have the pattern ABAB.

This draws attention to a further quality of the procedural ventures: the minimization of discussion of the procedure. An examination of the table showing the frequency of occurrence of moves in procedural ventures* reveals that moves from the procedure-centered group account for eight percent of the total of moves. However, procedure-centered moves occur in seven ventures or twenty-eight percent of the total. The point is that even when they occur, very few of them are used in a venture. This quality of procedure ventures is very similar to the minimization of the discussion of the rule in rule ventures; but the data suggest no equivalent of the 'return-to-rule' tendency.

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* (See Appendix II)

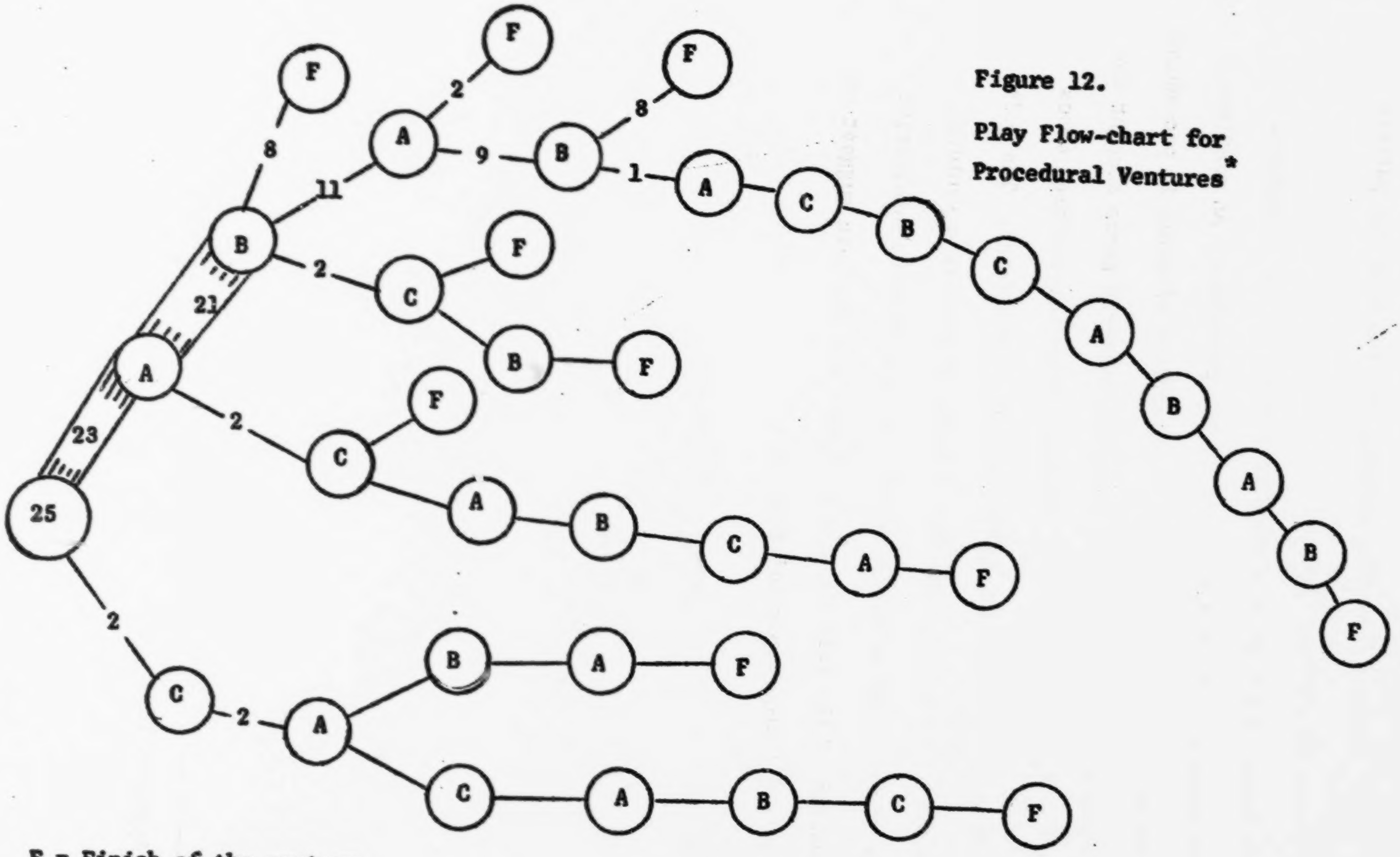
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Figure 12.

Play Flow-chart for Procedural Ventures*

F = Finish of the venture.

A = Sequence of moves all drawn from the problem-centered move group.

B = Sequence of moves all drawn from the performance-centered move group.

C = Sequence of moves all drawn from the procedure-centered move group.

* The method of computation is described in the chapter dealing with particular ventures.

Chapter XIII

ANALYSIS OF VENTURES DEALING WITH PARTICULARS

In some units of discourse a unique object, event, place or person is the primary focus of the discussion. A large number of these units is found in history classes. They contain discussions of such particulars as the election of 1896, the Teller Resolution, the Rough Riders, the Treaty of Paris, Andrew Jackson, and the Philippines at the time of the Spanish-American War. Typically, this sort of unit contains several kinds of information about the particular, including its characteristics, its relations with other things, and its significance. Although it is somewhat awkward, we shall use the expression "particular venture" to refer to units of discourse of this kind.

Distinguishing Particular Ventures

There is a strong resemblance between particular ventures and conceptual ventures. Conceptual ventures are concerned with the characteristics of the referent of a class term. Particular ventures are also concerned with the characteristics of some object. The major difference between the two is that conceptual ventures always discuss the characteristics of a class of things whereas particular ventures always discuss an individual object, event, person or place.* The name of a concept is always a common noun or phrase, but the name of a particular is always a proper noun or phrase referring only to a unique thing.

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* Of course, a particular may be considered to be a class of only one member. In this sense, particular ventures may be treated as a subclass of conceptual ventures.

A particular venture may contain information about the causes of the particular, about the reasons for it, or about its worth. It is distinguished from causal, reason, and evaluative ventures by the fact that it does not focus on any one of these types of information. Rather, it focuses on the characteristics of the particular object. Other kinds of information enter the discussion only incidentally.

Moves in Particular Ventures

A number of kinds of moves are used to give different sorts of information about particulars. The kinds of moves found in particular ventures are listed below and then discussed individually.

I. In the first group of moves are those items of information directly concerned with the nature of the particular in itself.

1. Particular identifying.
2. Attribute noting.
3. Attribute substantiating.
4. Classifying.

II. Moves in this group relate the particular to other events, objects or conditions.

5. Context describing.
6. Characteristic explaining.
7. Particular explaining.
8. Result citing.

III. This category contains a move dealing with the appraisal of the particular.

9. Assessing.

Particular identifying moves. Particulars are identified in several different ways. For example, the Treaty of Paris may be identified by the following types of utterances.

a. Now let's talk about the Treaty of Paris.
b. State the provisions of the Treaty of Paris.
c. What was the Treaty of Paris?

Any one of these utterances constitutes an identifying move when discussion in the venture as a whole focuses on the Treaty of Paris. An identifying move, then, names or refers to an individual object which is the focal point of discussion in the venture.

Example 1 contains a move in a venture concerned with the Little Rock school integration incident of 1957.

Example 1

T: Well, I guess the first thing we'll do is start out with Howard's report on Little Rock.

Discussion in the rest of the venture concerns the characteristics, consequences and significance of the Little Rock incident. Note the vagueness of this move. It indicates that something about Little Rock is to be discussed, but what that something is cannot be discerned from the move.

In Example 2 the particular is referred to rather than named. This example comes from a venture concerned with an engagement in the Spanish-American War.

Example 2

T: . . . , so the first engagement (of the Spanish-American War) concerned the Navy.

This move uses a descriptive phrase--the first engagement--to identify the particular.

The particular identified in the move below is a person; namely, Mark Hanna.

Example 3

S: Hanna?
T: That's Mark Hanna or Marcus Hanna.

Identification of the particular (Hanna) in this case follows the discussion of his characteristics and comes later than usual in the venture.

Attribute noting moves. Any information about characteristics, features or qualities of the particular constitutes an attribute noting move. Moves of this sort occur more frequently than any other kind of move.

An example of this move is taken from a venture concerned with the election of 1896.

Example 4

T: Well, how about William McKinley, the man picked to be the Republican candidate? Who was he? Have you ever heard the name McKinley before?
S: McKinley Tariff.
T: Yes, this was the same Mr. McKinley who had sponsored the tariff. He had been defeated when the Republicans had lost out in the congressional election of 1890, just as Bryan had been defeated when the Democrats lost out in the election of 1894. Now what position had Hanna been instrumental in getting him?
S: Governor of Ohio.
T: He'd been the governor of Ohio and now he was the candidate for the presidency.

Information about characteristics of the election of 1896 is provided here in the form of information about one of the candidates in that election.

Attribute substantiating moves. Moves in this category give evidence indicating that a particular does or does not have a given attribute. Such moves are infrequent. Ordinarily they occur only when an assumed characteristic is questioned.

The move in the following example was part of a venture dealing with the present government of Cuba. It supplies evidence against the claim that the government of Cuba has a military quality.

Example 5

T: I don't know whether you'd call it exactly a military government. In a sense, I suppose it would be, but the man who is in control I don't think bothers to keep himself in with the use of troops that are friendly to him. He doesn't consider himself really a military form of government.

That the man in control of Cuba does not keep himself in power by the use of troops is given as evidence against the claim that the character of Cuba's government is military.

The next example is a move from a venture discussing the book, The Spirit of St. Louis. It gives evidence supporting the claim that the book was written by Lindbergh's wife.

Example 6

S: I don't know where I read it, but they said that before Lindbergh came into fame by flying to Paris, he lived in a small town in Minnesota and was considered kind of an oddball and not very bright.
T: Perhaps so.
S: And they say that she or somebody behind her wrote the book.
T: Well, I think we'd have to see that documented a bit. Of course, Ann Morrow Lindbergh, his wife, has written some very fine books of poetry and other things.

Two sorts of evidence are given to support the contention that the book had the attribute of being written by Lindbergh's wife. First, it is indicated that Lindbergh may not have been capable of writing the book. Second, it is noted that his wife is an author.

Classifying moves. A move of this type notes that the particular is a member of some larger class of things. The class may be designated by a noun or by a noun phrase.

The first example to be considered occurred in a venture dealing with the Whig Party.

Example 7

S: O.K. What was the Whig Party?
S_1: Well, it was a political party.

Here it is noted that the Whig Party is a member of the class of things we call political parties.

The next example contains a classifying move from a venture in which the book, My Cousin Rachel, was discussed.

Example 8

T: What else?
S: And it's not a girl's story. It looks like it, but it isn't.

In this case the classifying move notes that the particular is not a member of a certain class of things (girl's stories).

Context describing moves. When the particular being discussed is an event, the discussion may contain information about the setting or context in which the event occurred. Such information constitutes a context describing move.

This example is from a venture which discussed the Little Rock school incident of 1957.

Example 9

S: The second flare-up of this incident of racial tension seemed out of place in the quiet, contented city of Little Rock. Integration had already taken place in the state colleges, in the university, the medical school, in the hospital, and on the busses. Negroes vote freely and easily in the city where there are three whites for every Negro person.

The context of the Little Rock incident, as indicated in this move, was a peaceful city which had already integrated in some respects.

The second example of context describing comes from a venture which occurred in a history class. It contains a discussion of the election of 1896.

Example 10

T: Now by this time we did have the Australian ballot. We didn't have it in use everywhere, but we did have the secret ballot in use in many places.

This move describes the context of the election of 1896 as including electoral laws that provided for a secret ballot.

Characteristic explaining moves. In some cases students are not content to know what the attributes of a particular are, they want to know why the particular has a certain characteristic or how it got the characteristic. Attempts to answer questions of this sort result in characteristic explaining moves.

The venture from which the example below is taken discusses the election of 1896. Prior to the move in the example, the class has noted, as one characteristic of the election, that Bryan was the nominee of the Democratic Party.

Example 11

T: How did he (William Jennings Bryan) happen to win the nomination in the Democratic Party?

S: Well, he was a real good speaker, and he gave his famous speech. And after he gave that, that cinched his nomination.

T: Do you remember what particular idea he tried to present in that speech?

S: Well, he called it the cross of gold and what he thought about the gold and silver problem.

> T: But he was speaking about pressing down upon the brow of labor with a crown of thorns and crucifying mankind with a cross of gold. The play on words, his ability as a speaker, caught the fancy of the convention and won the nomination for him.

In this move, the fact that the Democrats nominated Bryan is explained as being the result of Bryan's speaking ability. Bryan's nomination was one attribute of the election of 1896.

Consider another example of a characteristic explaining move. This one is part of a discussion of the formation of the Whig Party. An attribute already mentioned in the discussion is that the Whig Party was formed by persons of diverse backgrounds and interests.

Example 12

S_1: And what were their reasons for joining together into one party, since they differed so much in their lives?
S_2: To get Jackson out of office--defeat him in the next election.
S_1: Well, why did they want him out of office?
S_2: They didn't like his way of doing things.

In this case, the common desire of diverse groups to defeat Jackson is noted to explain the formation of the Whig Party by such groups.

Particular explaining moves. A move of this type attempts to account for the occurrence of a particular as a whole, not just a characteristic of it. It occurs only when the particular under discussion is an event or an action.

An example contains a particular explaining move from the venture mentioned earlier in which the Little Rock integration incident is discussed.

Example 13

> S: Probably only a small minority of colored people are insisting upon integration, but the NAACP is at work on it, however. They have been trying to get people in rural life, and Negroes especially, to fight for their rights.

In this move, agitation by the NAACP is cited to account for the occurrence of the Little Rock incident.

The move in Example 14 accounts for the particular--moving the Indians out of Georgia.

Example 14

> S: Arable land east of the Mississippi was scarce. The white man turned greedy eyes toward the fertile lands of the Indians so they bought the land from the Indians and moved them westward and gave them pretty poor lands west.

Two oonditions, scarcity of arable land and greed, are given to explain the act of moving the Indians out of Georgia.

Result citing moves. Moves falling into this category describe actions or events which followed from the occurrence of the particular or were made possible by its occurrence.

Again the venture concerned with the Little Rock integration incident provides us with a good example. This time it is an example of a result citing move.

Example 15

> S: Meanwhile, the troops are being trained for similar disturbances now, and will be ready, I think, next time something like this comes up, to take part in something like this.

The result of the particular noted in this move is that troops are now being prepared for similar incidents.

Another example comes from a venture concerned with the Hague Conference of 1899.

Example 16

T: Did anybody actually follow out this? [Court of arbitration set up by the Conference]
S: The United States did.
T: We were the first to use it, were we not? And they did go ahead with submitting cases to the Hague Tribunal over quite a long period of time.

Here the action of the United States in submitting cases to the Hague Tribunal is mentioned. This action was made possible by the Hague Conference.

Assessing moves. Some discussions of particulars go beyond describing them and render a judgment as to their worth or significance. To make such a judgment is to carry out an assessing move.

The venture from which this example was taken concerns the book, Stillness at Appomattox.

Example 17

T: All right. This is a good book, and I'd be glad to recommend it to all of you who are interested at all in it.

In this straightforward assessing move the teacher states that the book is good and recommends it.

The second assessing move to be considered comes from a venture in a history class. In this venture the so-called bargain between Clay and Adams in the election of 1824 is discussed.

Example 18

T: Well, this bargain we talked about is going to bother us in American politics for quite a while. If we had a few more minutes it would kind of fun to explore whether or not the bargain was corrupt. Rick, you concluded, though, that there was nothing corrupt in the bargain.
S: I don't think so.

The assessment of the bargain given here is that it was not corrupt.

Characteristics of Particular Ventures

The sample used for this chapter contained 62 ventures; 46 from history, 14 from core classes, and two from biology. A number of particular ventures were not analyzed for this chapter, and if these unanalyzed ventures are considered the distribution of particular ventures is wider. However, particular ventures still occur mainly in history and core lessons, and account for a large proportion of the ventures in these subjects.

Analysis of the patterns of moves occurring in particular ventures is still tentative but several characteristics of these patterns are apparent.

(a) Well over half of all moves in particular ventures are attribute noting moves. There is a marked tendency to return frequently to attribute noting moves throughout a venture. Further, a large number of ventures contain only attribute noting moves plus a particular identifying move.

(b) Relational moves, (those in group II) typically are preceded by moves in group I, especially particular identifying and attribute noting moves.

(c) Assessing moves are always preceded by attribute noting moves, and in the majority of cases by relational moves as well.

There would seem to be a very good reason for (b) and (c) being the case. It is probably easier and more informative to relate an object or event to other things when the students are clear about the nature of the object or event itself. Further, since objects and events are assessed on the basis of their characteristics, or their effects, it is reasonable to expect assessment to follow attribute noting and relational moves. Whether or not it is possible to teach particulars more effectively by breaking these patterns must be determined by further empirical research.

Chapter XIV

TEACHING AS RULE BEHAVIOR IN A SYSTEM

As we started this study, it was our intent to study both strategies of teaching and rule-guided behavior in teaching, without being very clear about what we meant by either of these. As it turned out, most of our effort was devoted to the strategies, as is evidenced by the previous chapters in this report.

The purpose of this chapter will be to outline briefly the results from the part of this study devoted to rule-guided behavior, or as we shall call it, rule behavior.[1] The chapter will include the background and rationale of the study, a tentative conceptual framework, some hypotheses about rule behavior, and brief comments on testing these hypotheses. In short, we will be developing and presenting a theory about rule behavior, which we will call rule theory.[2]

Background and Rationale

A number of factors were important in our decision to conceptualize teaching as behavior influenced to some extent by rules. Two aspects of the perspective in our first study (Smith, et al., 1962) were relevant. (1) We conceived teaching as a form of action, consisting of an agent called a teacher, a situation in which the act is initiated, an end toward which the teaching act is directed and two sets of factors in the situation. The first set is one over which the agent has no control, such as size of classroom. The agent can modify the second set of factors with respect to the end to be attained, i.e., such factors as assignments and ways of teaching. It seemed that at least some of these ways of teaching could be formulated as rules which the teacher could follow. However, the nature and kinds of rules are not at all clear in this conception. (2) We had already found examples of rules relevant to teaching in our first study, in which it became clear that each logical operation was conceivable as behavior strongly influenced by rules. We called these epistemic rules. They referred to such things as the correctness of definitions, the accuracy of facts, the adequacy of the breadth of descriptions, classification consequences, the soundness of explanations, and the generalizability of criteria.

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[1] The term 'rule behavior,' to be abbreviated as RB, will be used to refer to behavior which is in some way influenced by a rule. As will be discussed below, the degree of influence might vary considerably within this class of behavior, as reflected in such terms as 'rule-governed,' 'rule-guided,' and 'rule-oriented.'

[2] The term 'rule theory,' to be abbreviated to RT, will be used to refer to the theory developed here, i.e., the set of related hypotheses, some of which are given at the end of this chapter.

A number of additional considerations attracted us to the view of teaching as RB. (3) It was also quite clear that educational psychologists have been seeking rules for teachers, which are frequently stated in educational psychology texts. But these rules are different from epistimic rules. They are instrumental rules. (See discussion of these below.) Thus we have at least two kinds of rules relevant to teaching.

(4) To view teaching as guided by rules is somewhat appealing on experiential grounds. We all know, or think we know, what it means to follow a rule. At times it seems as though we almost live by rules, so that a few examples of rule-following will suffice to make clear at least initially what RB is. When we drive on the right side of the road, move

the pawn forward one square in chess, or use a singular verb with a singular subject, we are engaging in RB.[3]

(5) It often seems to be the case that teaching a person to follow a rule or set of rules is a convenient training device. This might also be the case with training teachers. Assuming we had the appropriate rules, we could use these to help train the future teacher.[4]

(6) Teaching apparently satisfies a number of provisional "criteria" for RB, such as involving the concept of making a mistake, awareness of another person violating a rule of teaching, being able to break the rule. (See section 1 B under Conceptual Framework for a discussion of these criteria.)

(7) Finally, and perhaps most important (assuming that teaching fits the criteria for RB), we thought that the basic paradigm of a person following a rule would provide a simple yet fruitful and powerful means for describing, explaining, and prescribing teaching behavior. (Peters, 1958; Brown, 1963; Bruner, 1966.)

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[3] Note the contrast of the examples of RB just given with the following, which are clearly not examples of RB: forgetting to turn out one's car lights, striking out in anger, running from a frightening situation, and all sorts of mannerisms and obsessions.

[4] This should be the case more and more, as research provides the basis for better instrumental rules and philosophic analysis provides the basis for better epistemic rules.

It was our hunch, then, and a rather strong one, that teaching could be thought of as some variety of RB, and that there were sufficient reasons for developing a point of view along these lines.*

At any rate, with the factors set forth above providing us with a rationale for developing a general view of teaching as a form of RB, we delved into the examination of terminological differences (e.g., rule-guided, rule-directed, rule-governed, rule-oriented, and rule-following), kinds of rules, factors involved in failures of RB, fruitful concepts, relevant theories, etc.

In general, we found the development of this view of teaching to be considerably more involved and complex than we had anticipated. The simple basic paradigm did not seem to work so well. There seem to be more kinds of rules involved in teaching than just epistemic and instrumental rules. Certain features or relations among rules seem to affect RB such as the vagueness of a rule, the extent to which a rule is unwarranted, conflicts among two or more rules (whether of the same or of different kinds) appropriate for a given situation, and the structure of rules (analogous to the hierarchical structure in the TOTE unit of Miller, Galanter, and Pribram (1960)). Many variables seem to affect various aspects of RB, but which ones, how much, and in which situations?

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* At this point we were aware, of course, of some general disadvantages of such a viewpoint. For example, RB does not seem to fit well into the prevalent behaviorist conceptual framework, an RB viewpoint does not seem to handle all the influences operating in the classroom, it is difficult to distinguish between RB and habitual behavior, etc. We hope, however, that our conceptual framework and further conceptual and theoretical developments will cope with these difficulties.

It also became clear that we needed a refinement of the central concepts or variables, especially in the statement of instrumental rules (since greater clarity of the epistemic rules was achieved in the first project). Then, too, it became apparent that considerable experimentation was required to determine the important variables affecting RB, and how various aspects of RB affect discussion and student learning.

Further, we began to feel as we worked on strategies that the logical operations in our earlier system of analysis would not be as fruitful to examine experimentally as the teaching strategies. These seemed more appropriate pedagogically, being closer to what the teacher has in mind when he is teaching, at least in the way of developing topics. It also became clear, as noted above, that other kinds of rules as well as epistemic and instrumental were involved.

Thus, since we had anticipated some relations between the two parts of the project, it seemed best to concentrate on the strategy parc of our project--the formulation of moves, the examination of patterns of moves on our transcripts, and the experimental testing of the outcomes of various patterns of moves and strategies. The results of these investigations have been reported in Smith, et al. (1964), Coombs (1964), Nuthall (1966), Meux, et al. (1967) and the preceding chapters of this report.[5]

But in spite of the difficulties we encountered, we felt that the basic paradigm of RB might still have heuristic value and provide the basis for an adequate conceptual framework for describing, explaining, and eventually prescribing teaching behavior.

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[5] This does not imply, however, that the move-patterns reported herein provide the basis for optimum instrumental rules.

If such a conceptual framework could be formulated, we could examine three distinct but interrelated sets of questions: conceptual, theoretical, and experimental.

Conceptual questions. What are the conditions for correctly applying the term 'rule behavior?' What does 'to act on a rule' mean? What does 'to act according to a rule' mean? What are the relations among concepts relevant to rule behavior such as belief, reason, goal, right, etc.? What are the relations between questions about behavior and questions about action?

Theoretical questions. What are the best perspectives in present psychology for describing and explaining RB--psychoanalytic, Gestalt, field, S-R, etc.? How adequate are these perspectives for the purposes of describing and explaining RB?

Experimental questions. How can we develop or facilitate RB? What are the optimum conditions for maintaining or stabilizing RB? What conditions result in RB "breaking down," i.e., in deviations from RB? Do conditions affect different phases of RB differentially? What psychological processes occur during RB?

Conceptual Framework

Turning now to a brief exposition of our conceptual framework, we will first present the two most important aspects of the basic paradigm--nature of rules and rule behavior--and then turn to the complications of the basic paradigm required to increase the adequacy of the conceptual framework.

I. The Basic Paradigm

A. Nature and Kinds of Rules. The nature of rules was discussed at some length in the earlier chapter on rule ventures. It was pointed out that rules are a guide to action,[6] and that rules can differ in a number of ways, such as whether they are based on empirical generalizations or convention, the range or scope of the rule, etc. Rules vary also with respect to the degree of influence the rule typically has on behavior with respect to the logical relation between the rule and the goal of the rule (this may be related to the degree of influence), and the kind of "punishment" for breaking the rule. Black (1958) distinguishes a number of characteristics of four kinds of rules.

Two rules are of special interest in our development of RT (rule theory)--epistemic and instrumental.

Epistemic Rules. Rules of this type were discussed and illustrated in our first study (Smith, et al., 1962). Each logical operation is characterized by a set of these rules which specify adequate behavior for that logical operation. In defining, for example, the definiens must not be more complicated than the definiendum. In causal explaining, the covering law must be highly confirmed.

Not only do epistemic rules specify adequate behavior for logical operations, they specify adequate behavior in ventures.

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[6] Since a rule is intended to guide or influence action (behavior), we can ask for a justification, support, or warrant of this guide. In this respect, justification of a rule is like justification of a rating in evaluation. The support may be adequate--a well-confirmed empirical generalization--or inadequate--as with authority, analogy, implications, etc.

We have not focused on epistemic rules in this study to the extent that we did in our first study. In the present study, we have focused on the *kind* of information used in achieving objectives. A little reflection, however, indicates the relevance of epistemic rules for accomplishing the objectives in ventures. For example, a clear and correct concept cannot be developed without the appropriate criteria, correct instances, etc.,[7] and an object cannot be evaluated properly without the adequate support of a criterion plus the relevant description(s).

Our use of epistemic rules below will refer to the epistemic rules relevant to a venture, rather than to a logical operation (unless otherwise indicated).

Instrumental rules. An instrumental rule[8] is stated in such a way as to specify what course of action is required to attain a goal successfully, and is based on an empirical generalization.

A network of concepts characterizes this kind of rule: concepts logically, but not deductively, related to each other. The logical relations among these concepts indicate that the concepts are not just contingently related.

Some of the logical relations among these concepts may be expressed roughly as follows. A course of action is right if it follows the rule, wrong if it does not. (Actually, for this kind of rule any course of action is right in the sense relevant here if it achieves the goal.) One can give as a good reason for following this rule that he believes doing this will achieve his goal. Or a good reason would be that this is the right thing to do. It would be logically odd for a person to say that he wants a certain goal, that he believes the rule to achieve this goal is a good one and then acts in a way contrary to the rule. If he did so act, we would expect him to give some reason that this contrary behavior would achieve the goal "better" in some way.

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[7] Perhaps this is a little strong. It is logically possible for a student to arrive at a clear and correct concept in spite of inappropriate criteria and bad instances presented by the teacher.

[8] This term is due to Bernard J. Diggs, as is the exposition. He is not responsible, of course, for this particular rendering of the nature of this kind of rule.

In our development of RT, instrumental rules will be stated in terms of or refer indirectly to sequences of moves. Thus an instrumental rule is closely related to a teaching strategy. For example, an instrumental rule for concept development might be: "To attain maximum clarity of a concept, use criterion moves, relational moves, and instancing moves." An instrumental rule for evaluating an object might be: "To achieve a clear understanding of the evaluation of an object, alternate rating and description moves twice, followed by two criterion moves and an analogy move."[9]

B. The Nature of Rule Behavior. What are the characteristics of RB? Several examples of RB have already been given explicitly or alluded to. If space permitted, RB could be clarified somewhat further by comparing it to various forms of rule-like behavior such as role behavior, norm behavior, engaging in a ritual, conforming to expectations, following a plan, . Giving examples of RB and comparing it to similar forms of behavior, however, are not adequate for our purposes. We need criteria for identifying RB, so that we can be a little clearer on the extent to which teaching can be viewed as RB.

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[9] Perhaps it is clear from these examples of epistemic and instrumental rules for ventures that it is somewhat difficult to separate the goals of these two kinds of rules. For this reason, the venture might be an especially fruitful "location" to investigate intensively some relations between (informal) logic and psychology.

We have not been particularly successful, however, in arriving at a set of clear, independent criteria for identifying RB. Thus, there is still considerable vagueness and overlap in our criteria. They may be stated briefly as follows:

(a) The concept of RB is linked with the concept of making a mistake, of being right or wrong. (Winch, 1958, p. 58)

(b) Rule behavior involves the awareness of rules as rules, in the sense that a person who knows a rule would be aware of another person's violation of this rule. (Bennett, 1964, p. 18; Green, 1964, p. 511)

(c) In principle, if a person were following a rule, someone else could discover the rule. (Winch, op. cit., p. 30)

(d) Rule behavior involves understanding both the meaning of "doing the same thing on the same occasion" and "going on in the same way." (Winch, op. cit., pp. 59, 61; Green, op cit., p. 521)

(e) If a person is engaged in rule behavior, then he should be able to break the rule, that is, to have a choice in or decide whether to follow the rule. (Bennett, op. cit., p. 17)

Further considerations which seem lesser candidates for criteria are as follows:

(f) If RB is involved, then someone else, after observing the behavior, can go on as a matter of course. (Winch, op. cit., p. 30-31)

(g) If one is engaged in RB, then it is intelligible to say that knowing the right way is based on what has been taught. (Winch, op. cit., p. 62)

(h) In some sense it seems important that the description of RB should include the term 'rule.' (Bennett, op. cit., p. 20)

For the purposes of this chapter, the detailed application of these provisional criteria to teaching will not be spelled out. However, an example of how one of the criteria might be applied is as follows. The criterion is (b) above, regarding the reaction of an observer who knows a rule. Suppose he observes the teacher's behavior in a situation in which an epistemic rule is in question. He is to decide whether a teacher is following this rule. He notes that the teacher's behavior does not conform to the rule. He questions the teacher and asks why he did not follow the rule on this particular occasion. (The observer states the rule clearly so that the teacher can understand it, making reasonably sure that he does understand the rule.) What would the teacher say? The following are a few of the possible answers the teacher might give:

(a) I had no control over myself. My behavior was caused. I had no choice.

(b) I didn't feel like it.

(c) That (particular) rule is irrelevant to teaching.

(d) I believe that logic is irrelevant to teaching.

(e) I didn't know that rule (but I'd use it if I did know it).

(f) I intentionally ignore logical rules when teaching values.

(g) We've gone through that procedure a number of times, so I didn't think it was important this time.

(h) I don't have the skill to handle (execute) that rule competently in class, and I don't want to get embarrassed in class and reduce my future effectiveness.

(i) I didn't realize that rule was appropriate here, but I do know the rule.

(j) Experimental evidence shows it to be unwise to follow the rule in that kind of situation.

(k) It is my judgment that it is unwise to follow that rule in that kind of situation.

(l) There just isn't time to do that kind of thing at all.

(m) I wasn't taught to do that in teacher training.

Note that the observer reacts to what he thinks is the teacher's violation of the rule by asking him for a justification. This indicates that he feels a rule is involved.

Some of the answers above do not give good reasons, but merely excuses, some poor (i, m) and some good perhaps (e).[10] Other responses are reasons, some (j, h) better than others (f, l). The fact that these answers are treated differently indicates that there is a rule involved and that it is felt to be of some importance. The observer may wish to question the teacher further, and would do so differently for the various answers (e.g., contrast a and j). And he could go through the same procedure for instrumental rules, getting somewhat different answers and following up with somewhat different questions.

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[10] Note the influence and relevance here of Austin's "A plea for excuses." (1961)

II. Complications

The discussion up to this point has considered only two kinds of rules--epistemic and instrumental--in rather simple contexts. The reader may well wonder how such a simple model or paradigm can serve as the basis for a theory of teaching.

We shall now discuss some ways of complicating this simple model in order to provide what seems to be a more adequate conceptual framework within which to develop a theory for descriptive, predictive, explanatory, and prescriptive purposes.

The complications involve aspects of the rules, qualifications in the degree of influence of the rule in cases of RB, and the context of RB, which contains many factors that can affect RB.

A. Aspects of Rules. Complications about the aspects of rules involve the vagueness of the rule, the warrant for the rule, the conflict of rules, different kinds of rules, and the structure of rules.

1. Vague or general rule. In the paradigm cases of RB the rule was quite clear, and the agent was clear as to what course of action to undertake to carry out the rule or to act on the rule. However, in the case of a vague or general rule the agent may not be sure what to do to act on the rule. This can lead to various kinds of deviation from the rule.

2. Unwarranted rule. In the paradigm cases of RB, the rule has clear support, i.e., a strong warrant.[11] However, epistemic and instrumental rules can both vary in the degree of support or warrant for the rule. In this case, assuming the agent knows about the lack of support, doubt is introduced as to how the rule should influence his behavior.

3. Conflicting rules. In the paradigm cases of RB, only one rule is relevant in the situation. However, many situations arise in which at least two conflicting and equally relevant rules confront the agent with a choice. We may distinguish here between cases in which all rules are clear and justified and cases in which all rules are vague or general and unjustified.

4. Different kinds of rules. The paradigm cases involve both epistemic and instrumental rules. However, there are other kinds of rules designated here as job rules, ethical rules, and context rules.[12] The effect on the agent's RB of the kind of rule is not clear at present. However, there might be some differences in the RB, depending upon which kind of rule is involved.

Job rules. This sort of rule[13] concerns achieving some goal on a job. A job rule is specified and enforced by an authority. On the other hand, an instrumental rule is not specified or enforced by an authority, but by "nature" (an empirical generalization). In the case of a job rule, of course, the authority may decide on the rule after examining some empirical generalization, and in that sense the job rule is based on an empirical generalization, as is the instrumental rule. In the case of the job rule, however, the right thing to do is basically specified by the authority, so the authority is the source of rightness, not the empirical generalization. But note that it is logically possible for a person to violate a job rule and still do the right thing in the sense of executing some other action which achieves the goal of the job rule.

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[11] 'Warrant' covers both empirical support for instrumental rules and logical-analysis-and-agreement support for epistemic rules.

[12] Note the omission of grammatical and legal rules here.

[13] The terminology and conception of instrumental and job rules adumbrated here is based on analysis by B. J. Diggs in some of his graduate seminars. He cannot be held responsible, of course, for this version.

The job rule is relevant to teaching. At least some of the rules specified by the principal or superintendent seem to be of this kind. For example, the principal or superintendent may specify that "When dealing with value questions, carry on the discussion in such a way as to collect and organize opinions and to avoid taking a position yourself." Such a rule would be one specified by an authority, with the goal presumably to avoid dissension and trouble with students and parents. Note that it is logically possible for the teacher to handle value questions in some way other than specified in the rule and still achieve the goal of avoiding dissension with students and parents on controversial issues. The job rules may or may not involve content, i.e., subject matter content.

Ethical Rules. In rules of this sort the teacher is involved with questions of responsibility and justifiability. These questions involve a conception of teaching and human nature, and are particularly difficult. Ethical rules seem most relevant in evaluative ventures. Some notion of an ethical rule relevant to teaching may be seen in the following: "When dealing with value problems and controversial issues, avoid the inculcation of attitudes by conditioning or other techniques."

Context Rules. A number of context rules are presented and discussed by Bellack (1965). Although these rules are typically not attended to continually by the teacher, a violation of the rules usually results in some upset of the classroom procedure. An example[14] of such a rule is, "Discussion is to take place within the substantive framework of the T's structuring." (Corollary: "A St is permitted an occasional irrelevancy in a discussion structured by the T.") Although there may be some advantage in combining these with instrumental rules, the advantage of distinguishing between instrumental and context rules is that instrumental rules can be limited to intentional, goal-relevant teacher actions (and for our purposes limited to subject-matter goals).

5. Structure of rules. In all the cases so far, only one rule was being followed at any given point in time. In the case of the conflicting rules, a choice had to be made as to which rule was to be followed, but once the choice is made only one rule is being followed. However, a further complication arises in that in many cases of behavior, it seems clear that the T's behavior may be influenced simultaneously by more than one rule, and by rules of various levels of generality, as in the case of a hierarchy of generality found in ventures and moves or in ventures and logical operations.

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[14] Suggested by Bellack (1965), pp. 176-181.
The symbols "T" and "St" stand for 'teacher' and 'student' respectively, and will be so used henceforth.

We have, as one example of a structure of rules, the conceptual scheme developed by Miller, Galanter, and Pribram (op. cit.), in which they designate their units of behavior as TOTE units (abbreviation for test-operate-test-exit). In this scheme a hierarchy of generality is involved. Note, however, that the rules at the various levels of generality can be all of one kind, for example, instrumental rules.

When different kinds of rules are involved in the structure of rules, the picture gets considerably complicated. This, however, seems to be what is typically going on in teaching. The teacher might be influenced simultaneously and closely by epistemic, instrumental, and ethical rules in the ventures with much more general and pervasive influence of job and context rules.

B. Aspects of Rule Behavior. Two aspects of RB which result in greater complexity of the conceptual framework are degree of influence of the rule and phases of RB.

1. Degree of influence of rule. The degree of influence of a rule on behavior can vary considerably, as reflected in such terms as 'rule-governed,' 'rule-directed,' 'rule-guided,' 'rule-oriented.' This can be seen easily by contrasting the rule-governed behavior in spelling, where the spelling behavior is dictated strictly by the rule of spelling, with the rule-oriented behavior of a parent disciplining his child, where the parent's behavior is oriented toward a general rule such as, "Punish the child only when he cannot perceive the consequences of what he has done."

Two kinds of deviation from the rule are possible, each resulting in variation in degree of influence in the rule. One involves adding to the behavior specified in the rule. The other involves omissions of behavior specified in the rule.[15]

We shall treat as equivalent the following expressions: "The degree of influence of the rule," "The degree to which the teacher (agent) adheres to the rule," and "The degree to which the behavior is rule-describable." These expressions vary somewhat in the relations stressed, for example, whether it is the relation of the rule to the typical or expected behavior, or the relation of actual teacher (agent) behavior to typical or expected behavior, or the relation of the rule to the typical or expected rule behavior. Thus the relations are among the following elements: teacher (agent), rule, the specified rule behavior, and the actual behavior.

A number of considerations are important in characterizing this rough continuum of degree of influence of the rule. (1) Goal-relevancy. Behavior not specified by the rule and not relevant to the goal is not considered in judging the degree of influence of the rule on behavior. (2) The judgment or measure of deviation from the rule has to be made within the context of some particular category-system or theory, e.g., our venture-move system. For example, the number, kinds, and distribution of moves actually made would be compared with those specified in the rule (strategy). (3) Standards of acceptability. The greater the influence of the rule, the higher the standards of acceptability and the less tolerance of deviation, as in spelling and grammar. Thus teaching strategies will have higher tolerance of deviation and lower standards of acceptability. (4) Vagueness of rule. How vague or general the rule is must be considered along with what must be added or filled in by the teacher on his own, as opposed to a specification or explication which already exists and is known, for example, explicating 'inductive strategies' as 'instancing moves followed by criterion moves.'

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[15] The reason for the addition or omission probably involves judgments regarding goal relevancy, i.e., adding behavior that is judged to increase the likelihood of achieving the goal, or omitting specified behavior that is judged irrelevant or even detrimental to achieving the goal.

The kind of evidence involved in determining the degree to which the teacher adheres to the rule includes the use of such measures as number of moves, kind of moves, and order of moves. The distribution of deviations in the venture might be considered, including whether the deviations are spaced periodically throughout the venture or are concentrated in one stretch, e.g., at the end of the venture. Whether the moves in the venture are short or long might also be considered, since something may be going on in the long moves that is not handled by our category system but might be relevant to the goal.

It is clear that behavior may deviate in various degrees from that specified by the rule. What happens when behavior deviates from this specification? Two distinctly different possibilities are of considerable interest for a theory of teaching. One possibility is that the teacher will fall back on the habitual behavior used before the rule is learned--a lower level of behavior. Another possibility is that the teacher will engage in problem-solving behavior to achieve the goal, combining various sub-rules and principles (Gagné, 1965). This is a higher level of behavior (ibid.). Hypotheses about what conditions will lead to these distinct kinds of behavior are presented in the section on hypotheses.

2. Phases of rule behavior. We have seen that behavior can diverge from that specified by the rule, and may diverge in various degrees.

Another kind of complexity is introduced when we view rule behavior as involving phases[16] such as planning, deciding, and executing. By examining the phases of RB we can pinpoint more accurately where and perhaps why something went wrong. That is, the "misfiring" of various aspects of RB can often be traced to these phases, as indicated by Austin in a discussion of the "machinery" of action. (op. cit.)[17]

Austin points out that the various mistakes that people make in actions are excused in many different ways, and that these many excuses can be organized and classified in such a way as to help clarify the "machinery" of action. He discusses several stages of action, which for our purposes are called phases:

Receipt of intelligence. This phase involves the gathering and collecting of facts relevant to the action (RB).

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[16] We use the term 'phases' rather than 'stages' because the RB in a venture is extended in time, thus permitting the overlap of phases.

[17] For our present purposes, RB is considered a subclass of action.

Appreciation of the situation. This phase includes getting the proper perspective, looking at the situation in a certain way, casting intelligence into various forms, etc. Thus:

> .... we can know the facts and yet look at them mistakenly or perversely, or not fully realize or appreciate some things, or even be under a total misconception. Many expressions of excuse indicate failure at this particularly tricky stage: even thoughtlessness, inconsiderateness, lack of imagination, are perhaps less matters of failure in intelligence or planning than might be supposed, and more matters of failure to appreciate the situation. (ibid., p. 142)

Invocation of principles. This phase of RB would involve examining the various available principles or sub-rules relevant to accomplishing a goal. (See discussions by Gagné (op. cit.) and Miller, Galanter, and Pribram (op. cit.).)

Planning. The ordinary sense of this term is all that is involved here.

Decision. This simply involves the choice of what the T considers as the best rule, plan, or course of action.

Execution. This phase involves actually carrying out some action, with some bodily movements, speech, etc. As Austin puts it,

> In the course of actually doing these things (getting weaving) we have to pay (some) attention to what we are doing and to take (some) care to guard against (likely) dangers: we may need to use judgment or tact: we must exercise sufficient control over our bodily parts: and so on. Inattention, carelessness, errors of judgment, tactlessness, clumsiness, all these and others are ills (with attendant excuses) which affect one specific stage in the machinery of action, the executive stage, the stage where we muff it. (Austin, op. cit., p. 141)

Viewing RB as being comprised of phases might be especially helpful in two ways. First, the ways in which the more complicated aspects of rules (see section II A) affect RB can be specified more exactly in terms of differential effects on phases. (This might be quite helpful, e.g., in teacher training.) Second, as already indicated, we might be able to classify breakdowns or "misfires" in RB according to the phase(s) in which the breakdowns occurred. If this can be done, we might then be able to sort out the causal factors or elements in the system, according to which phases they affect. This would enable us to specify optimal conditions for RB, i.e., those values or states of the system which result in RB not breaking down.

C. Rule Behavior in a System. It seems reasonably easy to identify a large number of variables which appear to affect some one or more aspects of rule behavior. The following list includes a sample of somewhat general classes of variables within which an indefinite number of specific variables could be identified: clarity, depth, rigor, pace, kind of teacher-student interaction, distribution of effort among cognitive objectives (frequency of each kind and patterning), whether teachers and students are acting as agents or reagents (Chein, 1962), degree of encouragement of autonomous inquiry, provision for equal opportunity, teacher and student roles (including prescriptions, relations, conflict, role differentiation), leadership, cohesiveness, group norms, student expectation, communication structure, sociometric relations, group decisions, group problem-solving, phases or stages in development of the group, shared attitudes, attraction relations, group size, coalitions and sub-groups, and equilibrium.

With such a wide variety of variables, one is immediately faced with the problem of organizing or unifying the variables with some scheme or theory in order to guide systematic research efforts.

What might be the most fruitful or optimum conceptualization or perspective?

Various empiricist and theoretical approaches are possible. These can be distributed roughly along a continuum representing the kind of approach. Thus at the empiricist end of the continuum one would approach the problem by attempting to construct classes of variables on the basis of criteria minimizing theory. McGrath and Altman (1966), for example, have developed the following classes of variables (each with two or three subdivisions): properties of group members such as personality, ability, and attitudes; properties of the group, such as group capabilities, interpersonal relations in the group, and general structural properties in the group; conditions imposed on the group, including social conditions and task and operating conditions; interaction process, including content, patterns, and outcomes; subjective measures of member and group performance, including perceptions of task performance of groups. Somewhat less empirically oriented is an approach which attempts to develop independent dimensions of groups, along which any kind of group could be placed. Borgatta, Cottrell, and Meyer (1965) discuss the approaches of Cattell and Hemphill, proposing that factor analysis be used as a complementary tool to help refine the dimensions. Since factor analysis is to be used, this brings in certain theoretical issues, and puts this approach slightly closer to the theoretical end of the continuum than the McGrath-Altman approach.

The theoretical end of the continuum[18] is exemplified in the five theoretical orientations discussed by Deutsch and Krauss (1965): Gestalt, field, reinforcement, psychoanalytic, and role. More specific to the classroom is the work of Lippitt (1960), who presents three kinds of "models", one having to do with interaction-feedback processes between T and Sts, the second with reference group-lifespace factors. He then combines these two models into a "mutual adaptation" model.

A number of approaches, then, are possible to achieve some kind of organization of the many variables which seem to affect aspects of rule behavior.

Our approach is perhaps near the center of this continuum, conceptualizing the classroom as a system, and using the McGrath-Altman scheme to classify the variables in the system.

Our theory of teaching, then, will involve conceptualizing teaching as RB occurring in the context of a system, this system consisting of various conditions or variables which influence each other and RB in a variety of ways. Our hypotheses will reflect the main features of this conceptualization. First, however, we will indicate briefly our conception of a system.

1. The Concept of System. The paradigm or root meaning of system seems to be an interrelated set of elements or components, the behavior of each being determined by the other elements or components and some objective of this set of components. (The commonsense view of system seems to include those aspects of behavior in which the variables have some naturalness of association.)

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[18] The approach through mathematical models belongs toward this end of the continuum, and is exemplified in the graph theory approach (Maccia, 1962; Harary, Norman, and Cartwright, 1965).

Upon closer examination, the notion of system seems to have a number of distinguishable features:

(1) The intended effect or objective of the system.

(2) The actual and observed output or effect.

(3) The boundaries of the system separating the system from its environment.

(4) The parts or elements of the system, describable in terms of number, constitution, constancy, and the degree to which they are united and integrated.

(5) Functional relations among the parts, for example, operating principles (such as reciprocating, cooperating, and negative feedback mechanisms which help maintain the cycle or output) and channels of energy and information exchange.

(6) Steady states or values of the variables, including constancy and homeostatic or boundary-maintaining states.

(7) Functional relations between the system and its environment.

2. The Classroom as a System. With this concept of system it is not too difficult to conceptualize the classroom as a system.

Intended and actual effects. For present purposes intended and actual effects can be treated as equivalent. Two distinct kinds of effects are individual needs and goals as opposed to group needs and goals. Each of these can further be divided into cognitive and affective. Individual cognitive needs and goals include learning of subject matter content. Individual affective needs and goals include establishing relations with others in the system. Group cognitive needs and goals include group decisions and group problem solving. Group affective needs and goals include establishing cohesiveness and reducing conflict.

Boundaries of the system. For an initial approximation, the boundaries of the system can be taken as the walls of the classroom. This is not conceptually precise, but for our purposes is pragmatically acceptable. (For example, the students are this unique group only in the classroom; and much experimentation on rule behavior in the context of a system can be done inside the classroom.)

Elements of a system. The elements are, of course, the teacher and the students. These are describable in terms of number, constitution, constancy, etc.[19] Teacher and student characteristics such as age, sex, ability, and personality are included here.

Functional relations among elements. The relations involved here have been investigated in a wide variety of experiments. Apparently there is nothing clear-cut in the way of stable relations, partly because so many interactions affect findings. One interesting kind of relation proposed to operate in the classroom is that which is often designated as feedback. However, in spite of its apparent importance, clear-cut findings are not available to indicate its role and importance in RB.[20]

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[19] We might postulate a system in which each element is basically an agent. However, the agent does not always act like an agent, part of the time acting as a reagent (Chein, op. cit.). We do not know what percentage of the time the agent is active and what percentage he is reactive, but observations and experience indicate some of both.

Steady states. Teacher-student interaction patterns and durable communication structures (e.g., sociometric structures) would be included here.

Functional relations between system and environment. This class of relations is discussed in the Gage Handbook in the chapter on social background of teaching (Charters, 1963).

Hypotheses

We have now developed a rough conceptual framework, outlining the nature and kinds of rules and RB, with three general kinds of complications which arise in attempting to describe teaching as RB: various aspects of rules, two aspects of RB, and the influence on RB of the classroom as a system.

We are now ready to state some provisional hypotheses within this conceptual framework. Because of the lack of relevant research, these must, of course, be conjectures.

What factors influence T RB? Assuming there are some factors which influence T RB, what kinds of relations are there between these factors and T RB? Our conception of the classroom as a system classifies the factors influencing T RB as well as aspects of rules and RB itself. For example, some of the factors are T characteristics, student characteristics, and group variables (dynamics and structure). The kinds of relations can be divided roughly into monotonically increasing, monotonically decreasing, nonmonotonic, and no relation at all.

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[20] Lack of space prohibits a discussion of the relevance of present classroom observation systems (e.g., Medley and Mitzel, 1963) for developing a more precise and adequate conception of the classroom as a system.

I. Some Simple Hypotheses

Focussing on the aspects of rules, the system factors just mentioned, and the kinds of relations just indicated, let us formulate a number of simple hypotheses.

A number of aspects of the rules themselves could influence a T's adherence to a rule, such as the vagueness of a rule, the degree of warrant of the rule, the relevance of the rule, and conflict of rules. Consider the following hypotheses:

(a) The T's adherence to a rule is a momotonically increasing function of the clarity (specificity) and relevance of the (instrumental) rule.

(b) The "quality" of the execution phase of RB is a monotonically increasing function of the clarity of the (instrumental) rule.

A number of T characteristics could influence RB, such as knowledge of content , knowledge of epistemic rules, skill in handling epistemic rules in discussions, preference for abstract treatment of topics. Consider the following hypotheses:

(c) The T's adherence to an epistemic rule is a monotonically increasing function of the T's skill in handling student errors resulting from following the rule.

(d) The T's adherence to an epistemic rule is a monotonically decreasing function of the abstractness of his belief (personality) system (Harvey, Hunt, and Schroder, 1961).

(e) The T's adherence to an instrumental rule is a nonmonotonic function of his knowledge of the classroom as a system.

The rationale for this hypothesis is that with no knowledge of the classroom as a system the teacher is at a loss to handle a wide variety of circumstances. However, as his knowledge increases past a certain optimum point it begins to confuse the teacher rather than help him, since he is faced with a large number of items of information which he cannot integrate fast enough to help him adhere to the rule.

A number of St characteristics could influence a T's RB, such as achievement motivation, knowledge of epistemic rules, persuasability, and kind of belief or personality system (Harvey, Hunt, and Schroder, op. cit.). Consider the following hypotheses:

(f) The T's adherence to an epistemic rule is a nonmonotonic function of the Sts' knowledge of the epistemic rule.

(g) The T's adherence to an epistemic rule is a monotonically increasing function of the Sts' (average) abstractness of belief (personality) system (ibid.).

A wide variety of group variables could influence a T's adherence to a rule or his performance in the various phases of RB. Examples of such variables are communication networks, feedback variables, role confliects, etc. Consider the following hypotheses:

(h) The T's adherence to an epistemic rule is a monotonically increasing function of the curriculum requirements and approval of the T's colleagues.

(i) The T's adherence to an instrumental rule is a monotonically decreasing function of the stress in the classroom.

(j) The "quality" of the planning and execution phases of RB (for both epistemic and instrumental rules) is a monotonically increasing function of approval of colleagues. (There is no relation between the intelligence and appreciation phases and approval of colleagues.)

(k) The "quality" of the intelligence, appreciation, and execution phases of RB (especially for instrumental rules) is a monotonically decreasing function of the complexity of the system (including fluctuation of crucial state variables and relations among units, negative or ambiguous feedback to the teacher).

A number of other variables could be listed which would have monotonically increasing relations with the T's adherence to a rule or some of the phases of RB, probably including a large number of ability factors both in T and St characteristics. A number of other variables of the stress and anxiety kind could be listed which would probably have monotonically decreasing relations with a T's adherence to the rule, although this number would undoubtedly be smaller than the number of variables having monotonically increasing relations. And still other variables having nonmonotonic relations with a T's adherence to a rule could be listed which would probably include a number of personality and especially group variables (which tend to have maxima around the center points of the ranges of the variables).

II. Systematization of Formulation of Hypotheses

The simple hypotheses already presented have included only a few of the variables which should be included in RT. The conceptual framework developed here permits us to be more exhaustive and systematic about the choice of which classes of variables are to be included explicitly in a hypothesis, and the number from each class. We will now present briefly a framework and terminology with which all hypotheses of interest can be formulated.

The main factors on which the classes of hypotheses differ can be summarized briefly as follows:

(1) Kind of rule, whether epistemic or instrumental;

(2) The "role"[21] of T RB, whether dependent or independent variable;

(3) Number of variables in each of the "role" variables, i.e., whether (a) the independent variable is univariate or multivariate, and (b) whether the dependent variable is univariate or multivariate;[22]

(4) Temporal location of the variable(s) relative to the instructional period, whether before, during, or after the instruction (initial conditions, strategy or discussion, and outcomes, respectively);[23]

(5) The number of elements of the system (topic, T characteristics, St characteristics, group, etc.) which are specified explicitly in the hypothesis;

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[21] Terminology of Tatsuoka and Tiedeman (1963).

[22] For convenience the multivariate specification will be designated a space, and its symbolic representation a vector;

[23] Further refinements are possible in specifying time intervals within any of the three temporal locations, thus including, e.g., retention tests at various points after instruction - one minute, one hour, one day, one week, one month, one year.

(6) Kind of relation between the independent and dependent variable, whether monotonically increasing, monotonically decreasing, or nonmonotonic or no relation at all.

Thus a hypothesis could be about (1) an epistemic rule (R_E), (2) T RB as the dependent variable, with (3) several aspects of T RB specified and the independent variable multivariate, (4) the independent variables being the initial conditions and the T RB during instruction with (5) two variables from each of the elements in the instructional system specified explicitly, and (6) all monotonically increasing relations.

Further refinements can be made in the terminology used in formulating hypotheses. For example, all the variables specified explicitly in a space may be in the class of T characteristics. If this were the condition space, we could designate it the T condition space; if it were the outcome space (and this is conceivable), we could designate it the T outcome space. If all the explicitly specified variables were St outcomes, this could be designated as the St outcome space. If all the explicitly specified variables were group variables during instruction, this could be designated as the group instruction space.

Of course, typically there will be more than one class of variables explicitly specified in the hypothesis.[24] The notation here could be illustrated as follows:

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[24] Note, however, that much of past and present teaching research, which can be described in terms of these spaces, involves only one class of variables in each of the role variables, such as a T condition space related to a St outcome space, or investigates only the group instruction space. In addition, many of the studies are only univariate in at least one space and often two.

T, St outcome space

Rule, Gp condition space

Rule, T, st, Gp instruction space

Testing Hypotheses

Clearly, with all these factors that might influence a T's adherence to a rule or the various phases of RB, establishing either the internal or external validity (Campbell and Stanley, 1963) poses difficult problems. The question of internal validity, of course, is one of research design or experimental control: how do we know that the independent variable(s) in the hypothesis is (are) the one(s) actually producing changes in the dependent variable(s)? The unspecified variables in the hypothesis must be controlled in some way, whether by manipulation, selection, measurement, or randomization.[25] Variables which are not controlled in one of these ways will remain as sources of doubt in interpreting the results.

Even if the question of internal validity could be solved, there would still remain the question of external validity, or generalizability of the results. With the likelihood of so many variables influencing T RB, the likelihood of interactions among subsets of the variables is quite high.

The question of measures of adherence to a rule is basically one of construct validity. Some of the initial measures that could be tried include number of extra moves (or number of moves left out),

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[25] The problem of which technique of control is used on which variable is another matter the experimenter must settle.

kinds of extra moves (or kinds of moves left out), the difference between the order of moves specified by the rule and the order of moves actually made, and the distribution of unplanned moves (whether spaced evenly throughout instruction or lumped together). Other measures might include a specially designed free-response test and an interview based on listening to a tape of the instructional period and discussing it with the T, such as questioning the T about the reasons for extra moves or moves left out.

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APPENDIX I

Criteria for Identifying Ventures

I. Definitions relevant to the concept of a venture.

1. The verbal behavior occurring during a class period is called the total discourse.

2. An utterance is the complete verbal behavior of one person at one point in the total discourse.

3. An episode is a unit of discourse involving a verbal exchange between at least two persons and focusing on a single point or item. It always contains more than one utterance.

4. A venture is a unit of discourse consisting of a set of utterances dealing with a single topic and having one overarching objective. It contains fewer utterances than the total discourse.

II. Criteria for Identifying a Venture.

1. The beginning of a venture is identified by one or more of the following:

   1.1 An utterance or part of an utterance containing an explicit indication (announcement or proposal), usually by the teacher, that a particular topic is to be considered. Such an announcement is usually followed by a question which initiates discussion of the proposed topic or by an invitation to speak on the topic.

   1.2 An utterance not explicitly indicating that a particular topic is to be taken up, but containing a question or statement that makes a marked change in the course of the discussion.

   1.3 An utterance containing a question or statement that initiates a discussion characterized by a new overarching objective.

2. Qualifications.

   2.1 When a venture includes one or more utterances containing a story, poem, student report, etc., or parts of such works or reports, new ventures may be identified in the subsequent discussion by criteria 1.1, 1.2, or 1.3 although the discussion continues to be about the particular story, poem, etc.

2.2 When a set of utterances concerns a number of mathematical problems, grammatical exercises or other examples and instances illustrating a single general principle (a rule of usage, a formula, a type of proof), these utterances together with any discussion of the general principle or further discussion of the instances shall count as a single venture.

2.3 When an utterance or set of utterances announces two or more topics to be taken up, the discussion of each topic counts as a venture, provided that each one is discussed independently rather than concurrently, provided that the discussions of the topics taken together do not form a topic unit having a single overarching objective. Discussions of the "pro" and "con," the "old" and "new," and other such bifurcations of the topic shall not count as separate ventures.

3. Exceptions.

3.1 If an utterance contains an explicit indication (announcement or proposal) that a particular topic is to be considered but another topic is discussed instead of the one announced, the utterance in which the topic is announced does not count as the beginning of a new venture. Such utterances are to be labeled 'misfires' and are not to count as part of any venture.

3.2 An utterance or set of utterances occurring within the discussion of a topic but wholly unrelated to the topic is not to be counted as the beginning of a new venture. Rather it is to be marked off from the venture and labeled 'disruption.'

3.3 An utterance or set of utterances containing a statement of the general subject with which class discussion is to be concerned for an entire period or longer, or statements of assignments, school announcements, etc., counts as an orienting statement and is not to be considered as part of any venture.

3.4 An utterance or set of utterances occurring within the discussion of a topic but only loosely related to the topic is to be counted neither as the beginning of a new venture nor as a disruption. It is to be counted rather as part of the venture within which it occurs.

4. The end of a venture is marked by no special cues. The termination of a venture is signaled only by the beginning of a new venture or by the occurrence of an orienting statement.

5. The duration of a venture is limited by the following considerations:

    5.1 A venture always contains fewer utterances than the total discourse.

    5.2 Ventures generally contain more than one episode. A venture is only coextensive with an episode if it is not possible to legitimately consider the episode as part of the discussion of a more inclusive topic having a single overarching content objective.

III The procedural rules governing the use of these criteria are as follows:

1. Read the entire transcript through without attempting to apply the criteria. Get a general idea of the sorts of topics the lesson is divided into, the way in which the teacher groups things for the sake of discussion.

2. Read the transcript through again. This time mark off ventures using all the criteria except 1.3. If the transcript is particularly difficult it may be advisable to mark the readily identifiable ventures first and then return to the hard portions.

3. Use criterion 1.3 to correct the markings made in (2) above. Remember, every venture must have a single overarching objective.

4. While length is not a criterion of a venture, length in excess of three or four pages of transcript does serve as a warning signal, indicating that the start of a new venture may have been missed.

Criteria for Classifying Ventures

I Definitions

1. A venture is a unit of discourse consisting of a set of utterances dealing with a single topic and having a primary cognitive meaning.

2. The cognitive meaning of a venture is the sense or import of the venture taken as a whole. A venture typically contains one or more sub-meanings or points which contribute to or make up the venture's primary meaning, and in some cases it contains irrelevant or peripheral materials. These sub-points and peripheral materials are to be distinguished from the venture's primary cognitive import.

    2.1 The cognitive meaning of a venture is not to be confused with the purpose or objective of the teacher. Nor is it to be mistaken for either the outcome of instruction or student learning. The cognitive meaning of a venture is derived from the discourse that makes up the venture, and not from efforts to divine the intent or purpose of the teacher or the effects of the venture upon students.

II Classes of Ventures

1. Causal Venture. The primary cognitive import of this kind of venture is the identification, description, or discussion of events, agents, or characteristics of events or agents which are said to cause, generate, or facilitate the occurrence of a particular phenomenon or class of phenomena. A causal venture is identified as one which satisfies one, or more than one, of the following criteria:

    1.1 A phenomenon is mentioned or discussed and the class engages in a discussion of the events, changes, agents, forces, or conditions which originate, lead to, or facilitate the phenomenon's occurrence.

    1.2 A phenomenon is mentioned or discussed and the class engages in a discussion of the dispositions or qualities of an agent or object that relates the phenomenon to some general law.

    1.3 A phenomenon, circumstance, or outcome is mentioned or discussed and the class discusses one or more means by which the phenomenon, circumstance, or outcome may be brought about.

2. Conceptual Venture. The primary cognitive import of this type of venture is that of disclosing the conditions or criteria governing the use of a term. A term may be a single word such as 'imperialism,' or an expression of two or more words such as 'coefficient of expansion.' A conceptual venture may be identified by one or more of the following criteria:

    2.1 An X is mentioned and the class discussion is primarily directed to such questions as: What is X? What does X mean? What do we mean by X? How can we tell when something is an X?

    2.2 Something is named or referred to, and the class discussion is mainly devoted to describing its characteristics, functions, uses, or parts.

    2.3 Something is named or referred to, and the class discussion is primarily devoted to mentioning or considering examples of it.

3. Evaluative Venture. The primary cognitive import of this sort of venture is to decide whether X is good or bad, right or wrong, fair or unfair, and the like. An evaluative venture may be identified by one or more of the following criteria:

    3.1 One or more characteristics, actions, policies, and the like are given and the class tries to decide the value category in which they belong, although no decision may be reached.

    3.2 One or more value categories are given and the students try to name or describe objects, events, characteristics, actions, and the like, that belong in the categories.

    3.3 A particular case of human conduct or line of reasoning is examined and the class tries to decide the value category to which it belongs, although no decision may be reached.

4. Interpretative Venture. The primary cognitive import of this sort of venture is that of disclosing the meaning or significance of a set of words or symbols or a bit of discourse. Usually the set of words or bit of discourse with which a venture is concerned is taken from a literary work. An interpretative venture is identified by one or more of the following criteria:

    4.1 A set of words or bit of discourse previously written or spoken is either given or explicitly referred to, and the class attempts to translate the meaning of the set of words or passage into a different set of words.

4.2 A set of words or bit of discourse previously written or spoken and constituting a metaphor or an allegory is either given or explicitly referred to, and the class attempts to state the literal meaning of the words or passage.

4.3 A set of words or bit of discourse previously written or spoken is either given or explicitly referred to, and the class attempts to draw inferences or conclusions about persons, objects, or events mentioned or described by the set of words or the passage.

4.4 An expression, object, event, or character is mentioned and the class or teacher deals with the question of what it symbolizes.

5. Particular Venture. The primary cognitive import of this type of venture is the provision of information or evidence to clarify or amplify a specified topic or group of related topics. The central concern of the discussion is the answering of questions such as, "What happened?" "When did it happen?" "What did it do?" "Who or what did it?" or "What is it like?" This type of venture may be identified by one or more of the following criteria:

5.1 One or more objects, events, or actions are mentioned or suggested and the class gives a description of it.

5.2 Some historical event or development is mentioned or alluded to and the class discusses the events and actions surrounding or comprising it.

5.3 A particular topic or event is mentioned or suggested and the class gives instances of a specified set of functional or descriptive characteristics, e.g., "What are the industries of Canada?" "What are the costs of crime?" 'Canada' and 'crime' are the topics, and 'industries' and 'costs' are the sets of characteristics for which instances are given.

5.4 Two or more objects or events are mentioned or suggested and the class describes each one by way of comparing them.

5.5 Exercises such as compositions are presented to the class either by students or teachers as examples.

6. **Procedural Venture.** The primary cognitive import of the procedural venture is a step-by-step description of how to perform an activity, reach a solution, carry through a plan, or the like. The procedural venture may be identified by the following criteria:

   6.1 The class or teacher analyzes a course of action, as in a recipe or in the instructions for carrying on an experiment, into steps or phases designed to reach a particular end.

   6.2 The class or teacher analyzes a symbolic process, as in an algebraic solution or the symbolic representation of a chemical reaction, into steps or phases.

   6.3 The class or teacher represents symbolically a chemical reaction or physical process so as to indicate, at least in a very general way, a procedure for, or considerations required in, making such representation.

7. **Reason Venture.** The primary logical import of this sort of venture is the identification or discussion of the reasons for an action, event, or conclusion. A reason is taken to mean the considerations or conditions given to justify a particular action, event, or conclusion. A venture of this type is identified as one for which one, or more, of the following criteria hold:

   7.1 A person's action or course of action is given, and the class discusses the desires, purposes, or beliefs used to justify it.

   7.2 A course of action or particular act is given, and the functions, ends, or outcomes used to justify or account for the adoption or execution of the action (or which account for the failure to adopt or execute the action) are discussed.

   7.3 A judgment or conclusion is given and the evidence needed to justify or defend it is discussed.

   7.4 An action, course of action, or state of affairs is given and the legal regulations or regulatory rules used to justify or account for it (or which account for the action or state of affairs not occurring) are discussed.

8. **Rule Venture.** The primary cognitive import of this kind of venture is either the making of decisions based on rules or identification and use of rules in the performance of an exercise or activity. A rule is a conventional guide or regulation for action, as in the rules of grammar or mathematics. A rule venture is identified by one or more of the following criteria:

   8.1 The discourse gives one or more cases involving one or more rules and the class is asked to make decisions as to what is the correct way of dealing with the case or cases. After a number of cases have been dealt with, the rule is usually stated by either the student or the teacher.

   8.2 The rule or rules are explicitly given in the discourse and the student is asked to apply them to one or more cases.

   8.3 A rule or formula which is used or intended for use in solving problems is discussed with respect to its derivation or logical or mathematical basis.

INSTRUCTIONS FOR CLASSIFYING VENTURES

1. Each venture can be classified by its cognitive objective into one of the following categories: causal, conceptual, evaluative, particular, interpretative, procedural, reason, and rule ventures.

2. Read the entire venture for the sense of it as a whole. Then read it again and try to formulate the question with which the venture deals. For example, does it deal with the cause of something? Does it attempt to get at the reasons for an act, decision, or whatever? By using the criteria given for each category, classify the venture into the category which it fits best.

3. No venture may have more than one objective.

4. If a venture is very difficult to classify, put it aside. When the easier cases have been grouped, return to the more difficult ones.

5. In some cases it is difficult to tell whether a venture belongs in the reason or in the rule category. Where there are a number of specific decisions or actions falling in a particular category and all regulated by the same rule or justified by the same reason (e.g., students are asked to decide which words in a number of sentences are verbs), the venture is to be called a rule venture. If the specific decision or action is justifiable by different reasons (e.g., students are asked why Mr. X went into the house), the venture is to be classified as a reason venture.

6. It is sometimes difficult to decide whether or not to put a venture in the evaluative category, although it containe a number of value judgments about different objects, ideas, etc. As a rule, when a venture centers in the evaluation of a single object, event, and the like, it is to be classed in the evaluative category. If the venture contains a number of evaluations about a number of different objects, events, reasons, and so forth, along with other materials, it does not belong among the evaluative ventures.

7. Particular ventures are sometimes difficult to distinguish from other sorts of ventures because all ventures are informative, and many provide information about particular objects or persons or entities. However, when information is given concerning the classificatory characteristics of an object or entity, and when information is given in response to some dominant logical enterprise such as evaluation, explanation, etc., the venture should not be classified as a particular venture.

APPENDIX II[*]

Moves in Concept Ventures

I. **Descriptive Moves.**

1. Characteristic. A single characteristic of a referent is explicitly noted or discussed.

2. Sufficient condition. A statement of properties or set of conditions is given as being sufficient to identify something as an instance of the referent.

3. Classification. A group of which the referent is a sub-group is noted or discussed.

4. Classificatory description. The referent is mentioned and described as a particular sub-class of a given class.

5. Relations among characteristics. Two or more characteristics are functionally related so that when one characteristic is varied (usually called an independent variable) the effect of the change upon other characteristics (usually called the dependent variable) can be noted and discussed.

6. Analysis. A set of parts which together make up a referent is noted or discussed.

II. **Comparative Moves.**

7. Analogy. The referent is said to be like something else. How the referent is like something else may be noted or discussed, or the referent may be said to be like something else, but there is no discussion of how the referent is like it.

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[*] There has been no opportunity to check all the final tabulations used in this report because of time factors and the distance between project members. Some inconsistencies might thus arise. However, such as do occur should be minor and will be amended subsequently.

8. Differentiation.

    8.1 The difference between the referent and something else is noted or discussed, or the relationships between the referents of two primary concepts are noted or discussed.

    8.2 What the referent is not, or that it is not the same as something else, is noted; but there is no discussion of how the referent is not the same as the other thing.

    8.3 The opposite of the referent is mentioned or discussed.

9. Instance comparison. The similarities or differences between two or more instances or sub-classes of the referent class are noted or discussed.

III. Instantial Moves.

10. Positive instance. An instance or sub-class of the referent is noted or discussed.

11. Instance enumeration. All instances or sub-classes of the referent are noted or discussed.

12. Negative instance. Something that is not an instance or sub-class of the referent but is similar enough to be mistaken for one, is noted or discussed.

13. Instance production. How an instance or sub-class of the referent is produced, or how it develops, is noted or discussed.

14. Instance substantiation. The reason or evidence for concluding that a designated instance is an instance of the referent class is given or discussed.

IV. Usage Moves.

15. Meta distinctions. The different uses of a term, the different meanings of a term, or the different conditions associated with a term are noted or discussed.

Table 22. Distribution of Moves in Concept Ventures by Subject and Teacher

Subject Area	History					Science					English				Math	Sociol.	Core	
Teacher	10	14	21	40	Total	11	22	33	41	Total	15	20	32	Total	42	31	13	Total (No. of Moves of Each Type)
1.*	4	4	6	24	38	12	186	126	263	587	12	5	1	18	9	15	3	670
2.						2	1	3	2	8			20	20	15	1		44
3.				1	1		20	6		26	1			1			2	30
4.				2	2	3	9	8	14	34	3	1		4	3			43
5.						6		1		7								7
6.				5	5		2	5	3	10			4	4				19
7.				1	1	3	16	10		29								30
8.	1	2		5	8	3	30	15	7	55	4		1	5	3	1		72
9.				1	1	1	3	3	2	9		1		1	1	1		13
10.	1			25	26	11	41	34	64	150	15	39	4	58	3	13		250
11.				1	1		4		7	11	2			2		1		15
12.							6	8	4	18	2	1		3		3		24
13.	1			1	2		1	4	16	21					2			25
14.				3	3	4	1	10	9	24	7	17	5	29	2	1		59
15.											5			5				5
Total	7	6	6	69	88	45	329	233	391	989	51	64	35	150	38	36	5	1,306

* Numbers refer to moves described on preceding pages

Moves in Causal Ventures

I Cause Describing

1. Cause Identifying. A condition or set of conditions is either (a) identified as a cause, or (b) identified as something which produces, or contributes to the production of a given effect.

2. Cause Explicating. The nature of a causal condition (such as the class of things to which it belongs, the context within which it occurs, what it is like, etc.) is noted or discussed.

3. Cause Evidencing. Evidence is given to support, or to refute, the claim that a condition given as a cause did occur, exist, was present, etc. All discussion or argument concerning the evidence for the existence of a causal condition is included in this move.

4. Cause Explaining. A condition, or set of conditions, which produces or explains the condition which has been cited as a cause, is noted or discussed.

II Effect Describing

5. Effect Identifying. A condition or set of conditions is either (a) identified as something which is to be accounted for, or (b) identified as that which follows from a given cause.

6. Effect Explicating. The nature of a condition given as an effect (such as the class of things to which it belongs, the context within which it occurs, what it is like, etc.) is noted or discussed.

7. Effect Evidencing. Evidence is given to support, or refute, the claim that a condition which has been noted as an effect did occur, exist, was present, etc. All discussion or argument concerning the evidence for the existence or occurrence of an effect is included in this category.

III Relational Moves

8. Causation Instancing. When either the cause or the effect, or both, is a class of things, reference may be made to an instance, or particular case of these classes. There are three different kinds of causation instancing moves:

   8.1 An instance of a class of things which has been cited as a cause is shown to occur in conjunction with an instance of a class of things which has been cited as an effect.

8.2 An instance of the class of things which has been cited as a cause is shown to produce or lead to some particular or general effect.

8.3 An instance of the class of things which has been cited as an effect is shown to be the result of some particular or general causal condition.

9. Generalization

9.1 A generalization, which includes the cause or effect being discussed as a particular case, is discussed or referred to as an explanatory principle or general law.

9.2 Evidence to support, or to refute, a generalization which covers the cause or effect being discussed as a particular case, is noted or discussed.

10. Chaining. Intermediate effects of the cause are described in order to link the cause to the effect being discussed.

11. Concomitant Variation. It is noted that, when different causal conditions occur, or when the context surrounding the causal conditions is changed, the effect is different, or does not occur.

12. Refuting Alternatives. Possible causes or effects other than those being discussed are eliminated.

13. Causation Argument. The proposed causal relationship is supported or attacked by means of evidence which lacks strict logical relevance to the causal relationship. The evidence may be of such diverse kinds as the following: (a) the opinion of an authority or expert is cited, (b) an analogy is drawn between a cause, an effect, or a causal relationship and some other cause, effect or causal relationship.

IV Meta Moves

14. Meta-cause. The nature of causal relationships in general, or the nature of evidence relevant to supporting such relationships is noted or discussed.

Table 23. Moves in Causal Ventures: Distribution by Subject Area and Teacher

Subject Area	History					Science					English			Soc.	Core	Total
Teacher	10	14	21	40	T	11	22	33	41	T	15	32	T	31	13	
1. Cause Identifying	7	14	21	4	46	1	9	24	31	65		4	4	26	3	144
2. Cause Explicating	3	5	7	2	17	1	2	5	13	21		1	1	4	6	49
3. Cause Evidencing	11	4	1		16			9	2	11		2	2	8	4	41
4. Cause Explaining		1	2	1	4									2		6
5. Effect Identifying	5	11	13	7	36	1	10	10	33	54	1	3	4	13	9	116
6. Effect Explicating	2	1		1	4			2	4	6					2	12
7. Effect Evidencing		2			2				1	1				1		4
8. Causation Instancing		1			1		2	8	5	15	1		1	9	1	27
9. Generalization		4			4				8	8				2		14
10. Chaining		1	5		6		1	1	3	5				5		16
11. Concomitant Variation		1			1			1	1	2				1	1	5
12. Refuting Alternatives	2	8		1	11		7	11	4	22	2	2	4	14	1	52
13. Causation Argument																
14. Meta-Cause	1				1		1			1						2
Total	31	53	49	16	149	3	32	71	105	211	4	12	16	85	27	488

Moves in Reason Ventures

I Action Elaboration Moves

1. Action identifying. The action, practice, decision or attitude accounted for in the venture is noted or described, or an action previously identified is described in more detail.
2. Action substantiating. The claim that the action actually did occur is affirmed or denied, or arguments are advanced to support or refute the claim.

II Purpose Elaboration Moves

3. Purpose identifying. The goal or purpose for which the action was undertaken is noted or described, or the value orientation underlying the action is noted or discussed.
4. Purpose evidencing. Evidence or argumentation is adduced to support or refute the claim that the actor had the purpose attributed to him.
5. Purpose explaining. Information which accounts for the actor's having a given purpose is noted or discussed.
6. Purpose justifying. An argument is given to support or refute the claim that the actor is justified in having the purpose he has.

III Rule Centered Moves

7. Rule citing. A rule or definition governing actions or practices of the sort being accounted for is noted or discussed.

8. Rule applying. Evidence is given to support or refute the claim that a given rule applies to the action being accounted for.

IV Factual Consideration Moves

9. Context describing. Characteristics of the action, the context in which it takes place, or the persons, or objects toward which it is directed are noted or discussed.

10. Consequence identifying. Consequences or results of the action are noted or discussed.

Table 24

Reason Ventures: Frequency of Moves by Subject Area and by Teacher

Subject Area	History				Science	English			Sociol.	Core	
Teacher	10	21	40	T	33	20	32	T	31	13	T
1. Action Identifying	17	6	3	26	1	2	3	5	3	4	39
2. Action Substantiating	4			4					1		5
3. Purpose Identifying	17	5	3	25	4		3	3	1	4	37
4. Purpose Evidencing	2	2		4			2	2			6
5. Purpose Explaining							1	1			1
6. Purpose Justifying	2		2	4	1		1	1			6
7. Rule Citing									1	1	2
8. Rule Applying										2	2
9. Context Describing	36	7	2	45		2	6	8	2	5	60
10. Consequence Identifying	12	1		13					1	3	17
Total	90	21	10	121	6	4	16	20	9	19	175

Moves in Evaluative Ventures

1. Identification Moves

1.1 Identification of Value Object and/or Value Term. Either the value object, or the value term, or both, are named or identified. In the case of the value object being a report or action, it may be given or performed.

2. Description Moves

2.1 Explication of Value Object

2.11 Description. A description of the attributes, properties, etc., of the value object. When the value object is an argument or proposition, this may include discussion of the premises, assumptions, or evidence on which the argument is based.

2.12 Classification. The value object is identified as a member of some more general descriptive (not normative) class of things.

2.13 Subsidiary Rating. The value object is given some rating which is different from (i.e., involves a different value term) from the rating which forms the main point of the discussion.

2.14 Instance Comparison. Instances of the value object are compared in order to illustrate or demonstrate some characteristic of the value object.

2.2 Identification of Relational Properties

2.21 Consequences. A description of the consequences, products, actions, outcomes, etc., of the value object.

2.22 Origins. A description or discussion of the antecedents, origins, causes or reasons for the value object.

2.3 Instance Description. An instance, or subclass of the value object is named or described. Characteristics, origins, consequences, etc., may be mentioned.

3. Rating Moves

3.1 Rating of the Value Object. The value object which forms the center of the discussion is rated as to its value.

3.2 Rating of Characteristics. Some characteristic or relational property (consequence or origin) of the value object is rated as to its value.

3.3 Instance Evaluation. Some instance, or subclass of the value object is rated as to its value. The instance may be either real or hypothetical.

4. Criteria Moves

4.1 Explication of Value Term. A description or discussion of the evaluative force, or meaning of the value term.

4.2 Citing Criteria. A standard or rule, or some set of alternative standards or rules, by which a rating of the value object can be made, are stated or discussed. There may, or may not be discussion of the relative importance of alternative standards or rules.

4.3 Substantiation of Criteria. Evidence or reasons for or against some rule or standard for rating the value object, are given or discussed.

4.4 Irrelevance of Value Term. The irrelevance of the value term, or some or all of the criteria for the value term, is asserted or discussed. Or it is asserted that the value term cannot be applied because of the lack of appropriate evidence.

5. Relational Moves

5.1 Explanation of Discordant Characteristics. Evidence or explanation is given to indicate why some characteristic of the value object which is apparently discordant with a previous rating, should be discounted or ignored.

5.2 Citing an Alternative Value Object. An object, practice, reason, etc., having a value rating different from the value object under consideration is cited or discussed. This alternative value object may be real or hypothetical.

5.3 Citing an Authority. The opinion or conclusions of some authority such as a public figure or textbook writer are cited as evidence for or against a rating of the value object. Any discussion of the credibility, or expertness of such an authority, is also included in this move.

5.4 Implication. A rating is supported on the grounds that it does not have the same characteristics or effects as other objects which have an opposite rating.

5.5 Analogy. The value object is likened to another object customarily believed to be either good or bad, or widely practiced. Evidence may or may not be given to support the analogy.

6. Tangential Evidence

6.1 Facts, beliefs, etc., which are relevant to the value object, but not directly relevant to the rating of the object, are cited or discussed. (Also included in this category are moves in which a value object, other than the one which is central to the discussion, is rated, apparently because of misunderstanding, misinterpretation, etc.).

Table 25. Distribution of Moves in Evaluative Ventures

Evaluative Ventures: Frequency of Moves by Subject Area and Teacher

	History				Science				English				Sociol.	Core	
Move #	10	14	40	Total	22	33	41	Total	15	20	32	Total	31	13	Total
1.1	8	1	4	13	1	2	1	4	15	2	10	27	3	4	51
2.1	14	3	1	18	-	2	-	2	11	1	8	20	4	7	51
2.2	5	8	35	48	-	4	1	5	11	1	3	15	3	4	75
2.3	6	-	1	7	-	1	-	1	2	2	-	4	-	-	12
3.1	12	3	1	16	-	3	1	4	17	-	14	31	7	9	67
3.2	1	-	2	3	-	2	-	2	1	-	-	1	4	-	10
3.3	9	-	1	10	1	2	-	3	3	1	-	4	4	-	21
4.1	-	-	2	2	-	-	-	-	-	-	-	-	-	-	2
4.2	10	-	-	10	1	3	-	4	4	-	3	7	1	3	25
4.3	-	-	-	-	-	-	-	-	-	-	2	2	-	-	2
4.4	3	-	-	3	-	-	-	-	-	-	-	-	-	-	3
5.1	2	-	-	2	-	-	-	-	-	-	-	-	4	-	6
5.2	1	1	-	2	-	-	-	-	2	-	2	4	-	1	7
5.3	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2
5.4	-	1	-	1	-	2	-	2	-	-	-	-	-	-	3
5.5	-	-	1	1	-	-	-	-	4	1	2	7	-	-	8
6.1	5	-	2	7	-	2	-	2	6	-	3	9	5	-	23
Total	76	17	50	143	3	23	3	29	76	8	47	131	37	28	368

Moves in Interpretative Ventures

1. Texture meaning. The meaning of specified expressions--words, phrases, sentences, and paragraphs--appearing in the text or reference material is given.
    - 1.1 The meaning of an expression regarded literally.
    - 1.2 The meaning of an expression regarded as metaphor.
    - 1.3 Paraphrasing a passage, not merely an expression, from a reference work.
2. Instrumental meaning. Expressions--words, phrases, etc.,--not appearing in the reference material are defined to facilitate further study.
3. Symbolic meaning. An object, event, person, or action mentioned in the text material is dealt with in terms of what it is used to stand for.
4. Structure meaning. The meanings that arise from, or are a function of, the reference work as a whole, as in the meaning of a story or a poem taken as a whole or at least in large part.
5. Extrapolation.
    - 5.1 Judgments made about persons, events, actions, etc. for which some, but not all the evidence needed for certainty, is given in the reference work.
    - 5.2 Judgments as to the cause of, or reason for, an event, action, feeling, etc., for which some but not all of the evidence needed for certainty is given in the reference work.
    - 5.3 Judgments made about persons, events, actions, etc., for which there is no evidence given in the reference work.
    - 5.4 Judgments concerning the effects of a literary work, or a part of it, upon the reader or listener.
6. Factual elucidation. Citing the facts as to what took place, etc., in the passage.
7. Citation.
    - 7.1 Passage is quoted essentially as it appears in a reference work.
    - 7.2 Passage or work to be interpreted is explicitly indicated either by name or by location in some larger work.
    - 7.3 A person, event, or action to be interpreted is mentioned or alluded to.
8. Representation. Citing a person as speaking or acting for a group or point of view.

9. Evidence. Evidence for or against a judgment, a particular meaning claimed for an expression or passage, etc., is given.

10. Identification of forms and devices.

    10.1 Noting devices, e.g., vignettes, used in a literary work to produce certain effects on the reader or listener.

    10.2 Noting the form of the literary work.

Table 26

Interpretative Ventures: Frequency of Moves by Subject Area and by Teacher

Subject Area	English				Sociol.	Core	Total (Frequency of moves in each category.)
Teacher #	15	20	32	Total	31	13	
1. Texture Meaning	15	3	15	33		3	36
2. Instrumental Meaning			2	2			2
3. Symbolic Meaning	3	1	5	9			9
4. Structure Meaning	3	2	4	9		2	11
5. Extrapolation	23	10	108	141	1	8	150
6. Factual Elucidation	15	3	28	46		3	49
7. Citation	13		21	34		4	38
8. Representation	9			9			9
9. Evidence	5	1	13	19			19
10. Forms & Devices	6		2	8		4	12
Total (for teachers)	92	20	198	310	1	24	335
Total (for subject areas)				310	1	24	335

Moves in Rule Ventures

1. Rule Formulation

A rule governing actions or decisions about alternative actions of a given type is stated or described.

1.1 The rule is the first rule stated or is compatible with the first rule.

1.2 The rule is contrary to a rule already given and covers the same range.

2. Range of Application

The range of a rule is explicitly noted or discussed independently of the rule formulation.

3. Combined Case Explication and Use

Activity which is guided by the rule and case explication are carried out in an intermixed, nondistinguishable way.

4. Case Explication

A particular situation or a type of situation is presented and explicated in terms which indicate how the rule is to be applied. This explication may serve to justify the use of the rule in the particular case.

5. Rule Verification

A rule (whether acceptable or unacceptable) is applied in some specific situation, and the resultant action or decision is tested against some explicit or implicit standard appropriate to such an action in these situations.

6. Term Explication

The meaning of one of the terms in the rule formulation is noted or discussed.

7. Use

Activity which is guided by the rule is carried out or described in a way distinguishable from case explication.

8. Rule Derivation

The way in which the rule may be derived from other rules is noted or discussed, or a demonstration is given that the rule is equivalent to or incompatible with some other rule. Where the rule concerns a theorem or formula appropriate to guiding actions in certain situations, this move may involve proving the theorem or formula, but does not include the theorem or formula thereby proved.

Table 27

Frequency of Moves in Rule Ventures

	Physics	English	Sociology	Geometry	Total	
Move #	T. 11	T. 20	T. 31	T. 42	F	%
1	6	55	5	52	118	20.2
2	1	25	1	13	40	6.9
3	1	8	-	20	29	5.0
4	4	81	-	47	132	22.6
5	-	2	-	2	4	0.7
6	2	15	-	-	17	2.9
7	1	186	1	47	235	40.3
8	2	1	-	5	8	1.4
F moves per T	17	373	7	186	583	100.0

Moves in Procedural Ventures

1. **Identification of Problems**

The problem(s) or situation(s) to which a procedure will be applied is (are) mentioned or referred to, either concretely or in general.

2. **Information Giving**

Information about the specific problem or situation to be dealt with in the venture is mentioned or discussed.

3. **Indication of End or Outcome to be Achieved**

The end, result, or product to which the performance should lead is mentioned or discussed, usually in a general rather than a specific way.

4. **Problem Analysis**

The factors or elements involved in a problem or situation are noted and their interrelations are pointed out or discussed.

5. **Summary of Steps**

The steps in a procedure are summarized in a schematic or point-like fashion, either generally or in terms of the particular problem dealt with in the venture.

6. **Range of Utility of Procedure**

An attempt is made to indicate, in some way, the range of problems, other than those dealt with in the venture, to which the procedure is also applicable.

6.1 Specific cases, situations or problems other than those dealt with in the venture are indicated, or referred to, or their location is given (as in a text).

6.2 The type of problem to which the specific problem dealt with in the venture belongs is indicated.

7. **Instrumental Concepts**

A concept involved in, or instrumental to the understanding of a procedure is mentioned or discussed.

8. Introduction of Recorded Performance

A record or completed description of a performance which has been carried out is introduced into the discourse.

9. Characterization of Performance

A performance is described, discussed, explained, carried out or evaluated.

9.1 An undifferentiated description of a performance is given rather than a description of the performance as a series of steps.

9.2 A specific part of the performance is described, discussed, explained, carried out or evaluated, either briefly or in some detail.

9.3 The end, result, or final outcome of a performance is explicitly mentioned, discussed, or indicated in a distinctive manner.

10. Discussion of Procedure

Description, explanation, discussion, or evaluation of the procedure itself is given, rather than of the procedure in its application to a particular problem situation.

10.1 An established procedure is referred to by name or other uniquely designating expression.

10.2 An established procedure or step thereof is developed or discussed in some detail, independent of application to the problem in hand.

Table 28

Frequency of Moves in Procedural Ventures

	Physics	Biology	Chemistry	Geometry	Total	
Move #	T. 11	T. 22	T. 41	T. 42	F	%
1	12	1	10	8	31	17.7
2	11	-	3	8	22	12.6
3	1	-	2	4	7	4.0
4	6	-	1	-	7	4.0
5	1	-	2	-	3	1.7
6	5	-	-	-	5	2.9
7	3	-	-	2	5	2.9
8	4	-	9	2	15	8.5
9	30	6	11	32	79	45.1
10	-	-	1	-	1	0.6
	73	7	39	56	175	100.0

Moves in Particular Ventures

Group I Moves directly concerned with the particular itself.

1. Particular identifying. The particular thing being discussed in the venture is named or referred to by a descriptive phrase. The particular may be an object, event, person, or place.
2. Attribute noting. An aspect, characteristic or quality of the particular is noted or described. When the particular is a person, place, or object, noting the history of the particular is included in this move.
3. Attribute substantiating. Evidence is given to support or refute the claim that the particular has a given characteristic.
4. Classifying. A class of things is named or mentioned and it is noted that the particular is a member of the class.

Group II Moves relating the particular to other events, objects, or conditions.

5. Context describing. The setting of events, objects, actions, feelings, etc., in which the particular occurred is described or discussed.
6. Characteristic explaining. The cause or reason for the particular's having a given characteristic is noted or discussed.
7. Particular explaining. The cause or reason for the occurrence of the particular is noted or discussed.

8. Result citing. Events following from the occurrence of the particular are noted or discussed. These may be caused by the particular or made possible by it.

Group III Appraisal of the particular.

9. Assessing. The particular is judged as having a given value or significance.

Table 29. Frequency of Moves in Particular Ventures

Move Number	Name of Move	Frequency
1.	Particular identifying	60
2.	Attribute noting	290
3.	Attribute substantiating	10
4.	Classifying	10
5.	Context describing	23
6.	Characteristic explaining	29
7.	Particular explaining	14
8.	Result citing	20
9.	Assessing	9
	Total	465